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An Overview of the Canadian Agriculture and Agri-Food System

2012

Canada

An Overview of the Canadian Agriculture and Agri-Food System

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This publication comprises data and analysis provided by all three Divisions of the Research and Analysis Directorate as well as contributions from other Divisions and Branches of Agriculture and Agri-Food Canada.

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FOREWORD

This 2012 report provides an economic overview of the Canadian agriculture and agri-food system.

It is meant to be a multi-purpose reference document to provide:

- an introduction to the agriculture and agri-food system;
- a snapshot of structural changes that are occurring throughout the system in response to various factors; and
- background data and information to inform public discussions on challenges and opportunities facing the Canadian agriculture and agri-food system.

Charts and tables with brief accompanying texts are used to summarize information and to provide base performance indicators.

The 2012 report begins with a special feature section that provides a description of employment trends in Canada's agriculture and agri-food system.

It also discusses characteristics of the agriculture labour force such as its age distribution and educational attainment.

The publication continues by reviewing each segment of the system, starting downstream with consumers to food distribution, and heading upstream to food and beverage processing, primary agriculture and input suppliers. It also contains a section that considers the environmental impacts of agricultural production in Canada including how Canada's agricultural producers are addressing environmental concerns. The report concludes with a review of government expenditures in support of agriculture and agri-food, including international comparisons of government measures of support.

It describes the Canadian agriculture and agri-food system as a modern, highly complex, integrated, internationally competitive and growing part of the Canadian economy. It is a resilient system, responding to the challenges and opportunities it faces by restructuring and adapting to changing consumer demands, advancing technology, North American integration and globalization.

Highlights

Importance of the System to the Canadian Economy

- The agriculture and agri-food system encompasses several industries including the farm input and service supplier industries, primary agriculture, food and beverage processing, food distribution, retail, wholesale and foodservice industries.
- It continues to play an important role in federal and provincial economies, making a significant contribution to Gross Domestic Product (GDP) and employment. In 2010, it directly provided one in eight jobs, employing two million people and accounted for 8.1% of total GDP.
- While primary agriculture accounts for a small share of the total economy (1.7% of GDP), it is at the heart of the agriculture and agri-food system and has grown on average by 1.5% per year since 1997.

Global Context

- The agriculture and agri-food sector has become increasingly internationally focussed over the past 15 years.
- The value of Canada's world agriculture and agri-food trade has increased in response to trade liberalization and global economic growth.
- The composition of trade has also changed with increasing exports of higher value-added processed goods that meet changing global demands.
- At the same time, the emergence of major competitors in growth economies such as China and Brazil has added to the challenges and opportunities of competing in global markets.
- Export opportunities are critical for the growth of most Canadian agriculture and agri-food industries. In 2010, Canada was the fifth-largest exporter and sixth-largest importer of agriculture and agri-food products in the world [if the EU is treated as a bloc], with exports and imports valued at $35.5 billion and $28 billion, respectively.
- The competitiveness of the agriculture and agri-food sector depends on its ability to remain profitable and viable over the long term in relation to its competitors in relevant markets. Long-run sales growth in domestic and international markets shows that Canada has remained relatively competitive in markets for agriculture and agri-food products in 2010.

Components of the Agriculture and Agri-Food System

- Changing consumer and societal demands are influencing changes throughout the whole agriculture and agri-food system. Consumers are demanding more variety, more convenience, more environmentally-friendly and healthier food choices, as well as food that addresses their values, e.g. organic and halal products, accompanied by proper assurances of quality and safety.
- Canadians enjoy some of the lowest food costs in the world, with spending on food from stores accounting for almost 10% of personal household expenditures in recent years.
- The food and beverage processing industry transforms primary production, and was the most important manufacturing industry in Canada in 2010. It is important for the agriculture industry, since 38% of agricultural production is used as raw material inputs by the food processing industry.

- Food and beverage processing experienced growth in 2010 leading to higher GDP, but a higher and more volatile exchange rate and higher input costs are forcing the sector to adjust its business strategies to remain competitive.
- There is an increasing number of farms diversifying production, producing niche products such as organics, adopting environmentally-friendly production methods and producing non-traditional products and services such as agro-tourism.
- Input suppliers and service providers also perform important functions in the agriculture and agri-food system. In 2010, producers spent over $34.5 billion in operating expenses, with commercial feed constituting the largest component. Recent decreases in the costs of fuel, fertilizer and pesticides eliminated some of the cost pressures on farmers in 2010.

Government Expenditures in Support of the Sector

- Total government (federal and provincial) support to the agriculture and agri-food sector increased slightly from 2009-2010 to reach an estimated $7.9 billion in 2010-11, or 33% of total sector GDP.
- Program payments continue to account for the largest portion of both federal and provincial government expenditures in support of the sector in 2010-11 at 41%, followed by spending on research and inspection at 25%.
- Government support to the sector varies across provinces. On the basis of government support as a percentage of agriculture and agri-food GDP, farmers in PEI, Newfoundland and Labrador, Quebec, Nova Scotia and Manitoba received the most support.
- Government spending in support of public R&D in agriculture and agri-food is important for the innovation and competitiveness of the sector. This spending has been increasing over the past three years and is now 33% higher than it was in 1990-91.
- Agricultural policies in Canada and other countries have evolved over time. Some countries have made major reforms to their agricultural policies, leading to reductions in levels of support and modifications to the types of support provided.
- Canada's Producer Support Estimate (PSE) for all commodities was estimated at 18% in 2010, compared to 7% for the U.S. and 20% for the EU. In 2010, the PSE declined for the main OECD countries mainly because of higher gross farm receipts and reduced market price support due to higher world commodity prices.

Employment Trends in Canada's Agriculture and Agri-Food System

- The Special Feature section this year focuses on employment trends in Canada's agriculture and agri-food system.
- Employment in the agriculture and agri-food system increased by 14% between 1997 and 2010.
- The agriculture and agri-food system is a major employer in most provincial economies, contributing jobs and economic activity.
- In 2010, employment in foodservice and food retail/wholesale grew by over 30% compared to 1987, while that in food processing followed a stable trend with modest increases since 2000.
- Employment in primary agriculture, as a share of Canada's total employment, is comparable to the G7 average at 2.3% of the total, but it is higher than in the U.S. and the UK.

SECTION A

Special Feature

SECTION A1

Employment Trends in Canada's Agriculture and Agri-Food System

INTRODUCTION:

Employment in both the primary agriculture and food processing industries has been declining as a share of employment in the agri-food system, while jobs in the food retail and foodservice industries are fast-growing areas of the system. This section looks at the trends in employment, its characteristics and some of the related challenges.

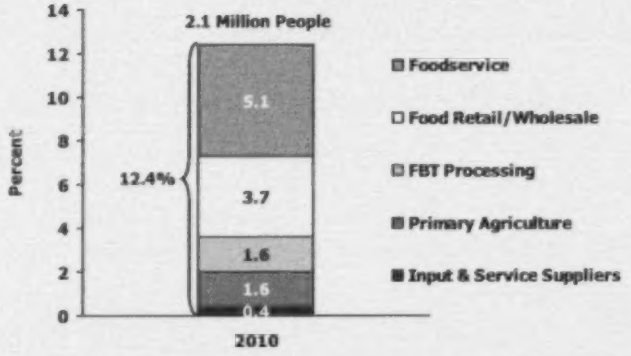
Employment in the Canadian agriculture and agri-food system accounts for approximately 12% of total employment in Canada

- **The agriculture and agri-food system employs over two million people, and provides approximately one in eight jobs in Canada.**

  Primary agriculture and food processing make up about 3.2% of total employment in Canada.

  Foodservice is the largest contributor, at 5.1%, followed by the food retail/wholesale industry at 3.7%. In 2010, the share of employment accounted for by food retailing was higher than the share represented by food processing and primary agriculture employment taken together.

Chart A1.1
Agriculture and Agri-Food System's Contribution to Employment
2010



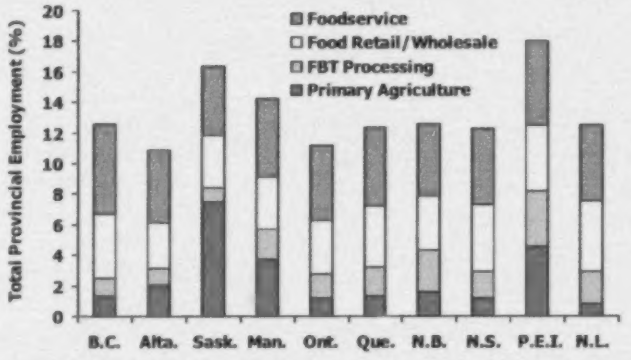
Source: Statistics Canada, Annual Labour Force Survey and AAFC calculations.

- **Employment in the agriculture and agri-food system is also important to most provincial economies.**

  Employment in the foodservice industry is important in all provinces.

  In Prince Edward Island and Saskatchewan, employment in the agriculture and agri-food system accounted for 18% and 17% respectively, of provincial employment. Primary agriculture is also a major employer in these two provinces at 4% and 7% of the total, especially compared to other provinces.

Chart A1.2
Agriculture and Agri-Food System's Share of Provincial Employment
2010



Source: Statistics Canada, Annual Labour Force Survey and AAFC calculations.

Note: Provincial input & service suppliers have been excluded because of confidentiality with many of its component industries.
2010 data is preliminary.

NOTE(S):

Much of the data in this section is from Statistics Canada's Labour Force Survey. The **labour force** is composed of those members of the civilian non-institutional population 15 years of age and over who, during the reference week, were employed or unemployed. **Employed** persons are those who either worked during the reference week, or those who had a job but were not at work during the reference week.

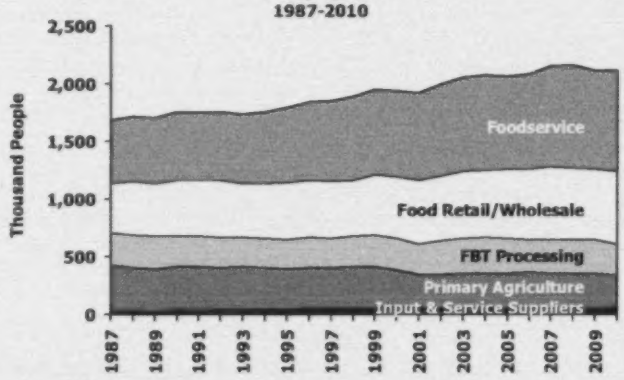
The foodservice and food retail/wholesale industries account for an increasing share of employment in the agriculture and agri-food system

- **Employment in foodservice and food retail/wholesale has grown faster than in the other parts of the system. In 2010, each of these industries employed over 30% more people compared to 1987.**

  During this time, employment in primary agriculture has been decreasing by more than 1% per year.

  Employment in FBT processing has fluctuated, but generally followed a stable trend, with modest increases since 2000.

Chart A1.3
Agriculture and Agri-Food System's Contribution to Employment
1987-2010



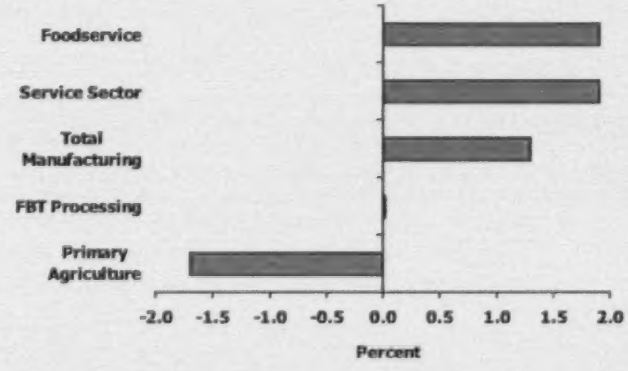
Source: Statistics Canada, Annual Labour Force Survey and AAFC calculations.

- **The importance of service sector jobs in the overall economy has increased over time.**

  Since 1987, service sector employment rose by an average rate of 1.9% per year, similar to the growth in foodservice employment.

  At the same time, employment in total manufacturing grew by an average annual rate of 1.3%. FBT processing employment hardly grew over this period. But primary agriculture employment fell by 1.7% per year on average, reflecting the significant productivity gains and consolidation that has occurred in the industry over this period.

Chart A1.4
Average Annual Growth Rates in Employment by Sector
1987-2010



Source: Statistics Canada and AAFC calculations.

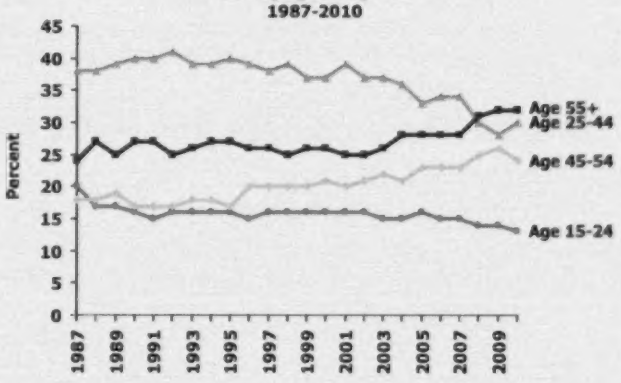
The changing age structure of the workforce in the primary agriculture and food processing industries is expected to have an impact on the sector's labour supply over the coming decades

- **The largest share of employed workers in agriculture is now in the 55+ age group.**

  While historically most workers in agriculture were in the 25 to 44 age group, workers aged 55 and over now account for a greater share of agriculture employment since 2008.

  The share of farm workers in the 15 to 24 age group has declined steadily during the past decade, while farm workers in the 45 to 54 and 55 plus age groups have increased steadily. This is also the case in the total labour force where those older employees (aged 45+) have grown as a share of the total by 3.7% per year, on average, since 1987.

Chart A1.5
Share of Agriculture Employment by Age Group 1987-2010



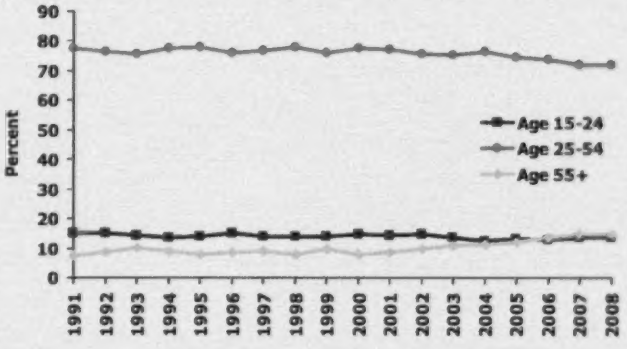
Source: Statistics Canada, Annual Labour Force Survey and AAFC calculations.

- **Most workers in food and beverage processing are between the ages of 25 to 54.**

  However, this share has fallen steadily over the past two decades.

  The number of workers aged 55 and over has grown on average about 5% per year, and now makes up a larger share of employment than workers under the age of 24.

Chart A1.6
Share of Food and Beverage Processing Employment by Age Group 1991-2008



Source: Statistics Canada, Labour Force Survey, special tabulation.

Over the last half century, primary agriculture has experienced a long-term decline in employment both in Canada and around the world

- **Primary agriculture accounts for a declining share of national employment in most developed countries due to the shift toward knowledge and service-based jobs.**

  The rate of decline in primary agriculture's employment share was fastest during the 1950s in all OECD countries. In the 1960s it fell to half that in most countries. It has continued to decline, albeit at a slower rate, over the past fifty years.

  In Canada, this share followed a similar trend comparable to certain other G7 economies. It fell sharply from 13% in the 1960s to 7.5% in the 1970s. It has since declined to 2.3% in 2008. In Britain and the U.S., this share now accounts for just over 1% of employment.

Chart A1.7
Agriculture Employment as a Share of Total Employment in Selected OECD Countries
1960-2008

	1960	1970	1980	1990	2000	2008
	Percent					
Australia	10.9	7.5	6.5	5.5	4.8	3.3
Canada	13.0	7.5	5.1	4.4	2.8	2.3
France	21.6	12.9	8.3	4.9	3.3	2.6
Germany	13.1	8.1	5.2	4.1	2.6	2.3
Japan	29.0	15.9	10.0	6.7	4.9	4.2
UK	4.6	3.2	2.7	2.2	1.4	1.1
U.S.	8.1	4.4	3.5	2.9	2.5	1.5
G7	16.5	9.5	6.2	4.4	3.1	2.3

Source: OECD, Annual Labour Force Statistics Database, Summary Tables.

- **The trend toward a more service-based economy in Canada reflects similar developments in the U.S. and Australia.**

  The share of employment in the service sector averages around 80% in both Canada and the U.S., and 77% in Australia.

  Between 1970 and 2010, service sector employment as a share of total employment grew in all three countries.

Chart A1.8
Share of Total Employment in the Service Sector in Australia, Canada and the U.S.
1970-2010

	AUSTRALIA	CANADA	U.S.
	Share of Total Employment (%)		
1970	57.1	63.3	61.7
1980	64.3	68.8	66.2
1990	70.8	71.8	74.0
2000	75.1	76.0	78.2
2010	77.5	79.1	80.8

Source: OECD, Annual Labour Force Statistics Database, Summary Tables.

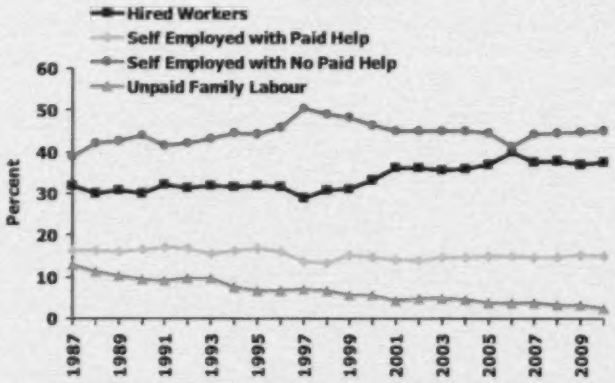
Other long-term structural changes in agriculture that have had an impact on employment include the declining use of unpaid family labour and the rise in off-farm employment

- **Unpaid family labour accounts for a significantly smaller share of employment in agriculture than it did in the past, while the share of hired labour has increased.**

  Since the late-1980s, the number of hired workers as a share of total agriculture employment has risen to almost 40% of the total, while the share of unpaid family workers has dropped the most.

  Employment in agriculture is still primarily characterised by self-employed producers with no paid help, which accounts for almost half of agriculture employment. However, employment in this group has also declined steadily over the past decade and a half.

Chart A1.9
Share of Total Agriculture Employment by Class of Worker 1987-2010



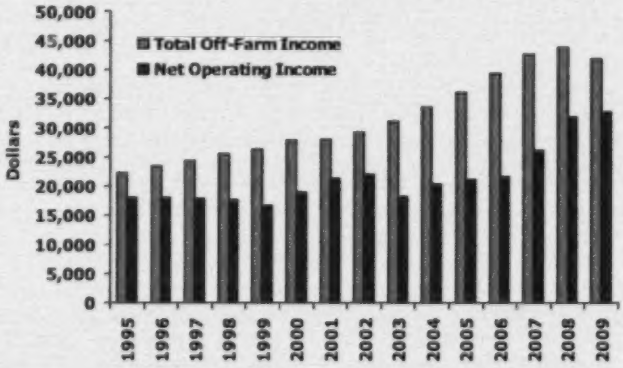
Source: Statistics Canada, Annual Labour Force Survey and AAFC calculations.

- **Income from off-farm employment has helped to supplement income for farmers.**

  Since 1995, off-farm income has risen from $22,254 per farm to over $41,000 in 2009.

  Investment income has also contributed to this increase.

Chart A1.10
Growth in Average Off-Farm Income for Farms 1995-2009



Source: Statistics Canada, Taxation Data Program and AAFC calculations.
Note: Average accounts for both incorporated and unincorporated farms. Total off-farm income includes taxable capital gains.

NOTE(S):

The Labour Force Survey (LFS) reports employment according to the "main job" of the respondent, that is, the job in which the respondent worked the most during the reference week. For example, a worker reporting employment in agriculture is someone who works on a farm as their main job. A farm worker who works in farming as a second job is assigned to another industry. This feature of the LFS can pose challenges for interpreting the data in industries where multiple job holding is common since employment and hours worked for the second job are not collected.

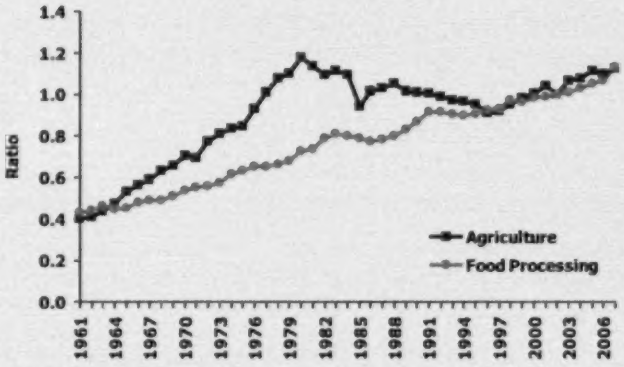
As the agriculture and agri-food sector becomes more capital intensive, there will be an increasing need for highly-skilled labour

- **Capital to labour ratios, which are an indicator of capital intensity in both agriculture and food processing, have increased over time.**

  Capital intensity in the agriculture industry rose steadily and peaked in 1980. This reflects a high rate of capital accumulation that occurred in the 1970s, but also falling employment. Since 2000, the capital to labour ratio has climbed mostly due to a continued decline in labour.

  Meanwhile, capital intensity in food processing has risen steadily since the 1960s, reflecting continued capital accumulation relative to the amount of labour employed in the industry.

Chart A1.11
Capital to Labour Ratios
in the Agriculture and Food Processing Industries
1961-2007



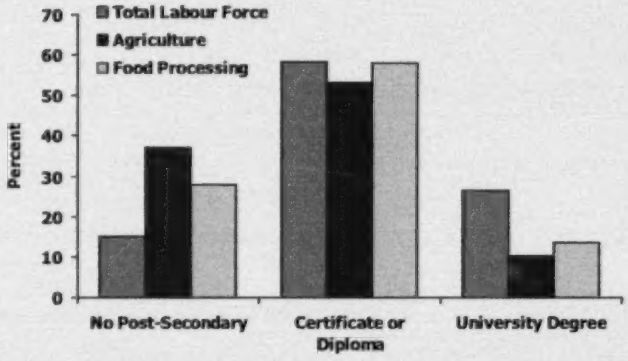
Source: Statistics Canada and AAFC calculations.

- **Compared to the general population, employees in the agriculture and food processing industries tend to have lower education levels.**

  Agriculture and food processing both have higher shares of workers with no post-secondary education at 37% and 28% respectively, than in the overall labour force. The total labour force has about 15% of people with no post-secondary education.

  The share of the agriculture and food processing industries' labour force with certificates or diplomas is comparable to those in the total labour force, but are lower for those with university education.

Chart A1.12
Agriculture and Food Processing Industry's Education Level
Compared to Labour Force
2006



Source: Statistics Canada, Census of Population and AAFC calculations.

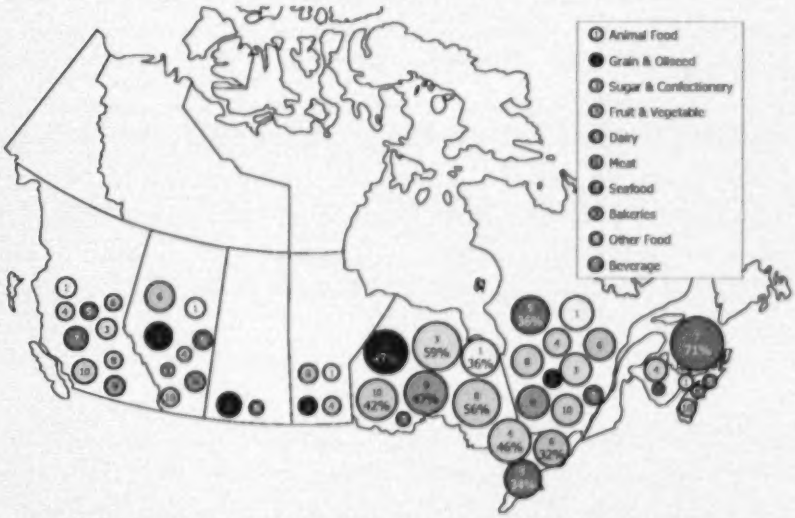
Employment in the food and beverage processing industry varies across the country because the industry is not evenly distributed across provinces

- **There were 273,000 employees in food and beverage processing in 2010. Regionally, food and beverage processing plants are primarily located in Ontario and Quebec. Together these provinces account for over 60% of the value of food processing shipments.**

  Other important sectors and regions include seafood processing, in eastern Canada and grain and oilseed milling in Saskatchewan and Manitoba, as well as meat processing in Alberta, Manitoba, Ontario and Quebec and dairy in Quebec and Ontario.

  Based on employment, central Canada also accounts for the largest share of food and beverage processing employment, at 66% of the total.

Chart A1.13
Provincial Contribution to Canadian Food and Beverage Processing Shipments by Sub-Industry 2009

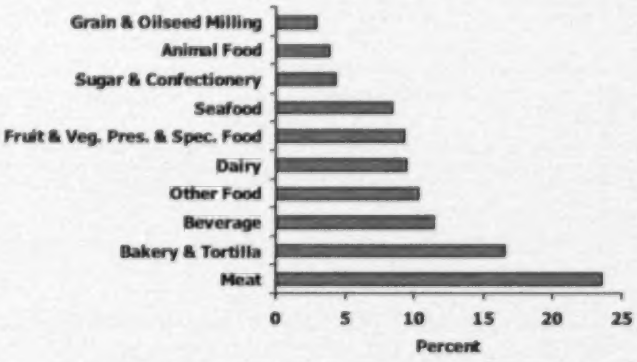


Source: Statistics Canada, Annual Survey of Manufactures and Logging (2009), and AAFC calculations.
Note: Industry representation does not necessarily equal 100% across Canada. Shares of less than 4% are not represented. Atlantic data is aggregated.

- **Food and beverage processing industry employment is distributed among a range of different sub-industries.**

  Employment in the meat processing sub-industry accounts for almost 25% of food and beverage processing employment, followed by the bakery and tortilla sub-industry at 16%.

Chart A1.14
Food and Beverage Processing Employment by Sub-Industry 2010



Source: Statistics Canada, Survey of Employment, Payroll and Hours and AAFC calculations.

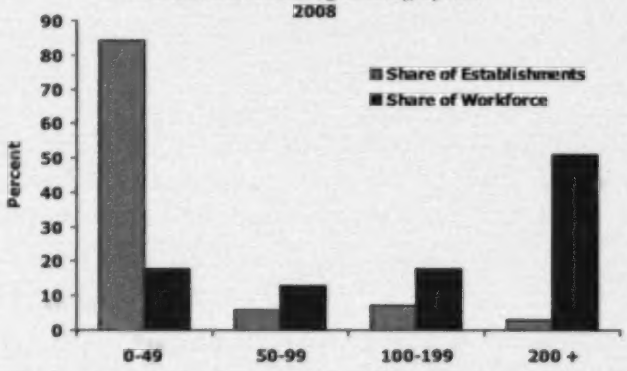
Food processing establishments vary by size and occupational groups

- **Most of the employment in the food processing industry occurs in larger firms.**

  While just 3% of food processing establishments have over 200 employees, these large firms account for half of the food processing industry's workforce in Canada.

  Most food processing establishments in Canada are small, with fewer than 50 employees, but together these small firms account for less than 20% of the food processing industry's workforce.

Chart A1.15
Distribution of Establishments and Workers in the Food Processing Industry, by Size
2008



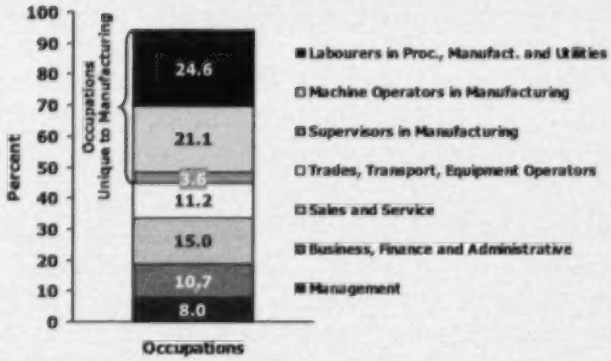
Source: Statistics Canada, Annual Survey of Manufacturers and Logging, special tabulation.

- **The food and beverage processing industry's labour force falls into many diverse occupational groups.**

  Occupations in management accounted for less than 10% of the industry's labour force in 2006, while those in sales accounted for about 15%. Workers in business and trades each accounted for about 10% of the industry's labour force.

  According to the last census, about half of food and beverage processing industry workers are in occupations "unique to manufacturing". Of those, about 25% were production labourers and 21% were machine operators. Supervisors specific to manufacturing accounted for 3.6% of the industry's labour force in occupations unique to manufacturing.

Chart A1.16
Share of Selected Occupations in the Food and Beverage Processing Industry
2006



Source: Statistics Canada, Census of Population and AAFC calculations.

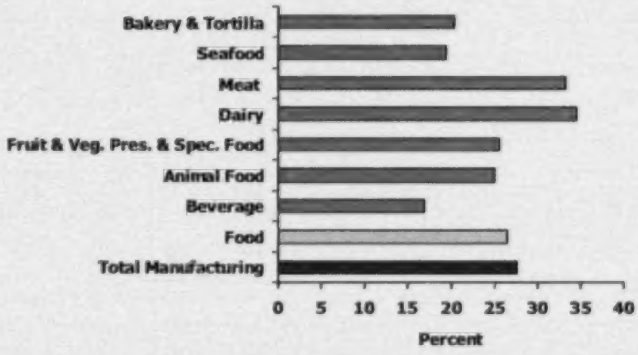
In the food processing industry, firms tend to view the lack of skilled labour as an obstacle to the adoption of advanced technology or innovation

- **In 2009, over 25% of food processing firms claimed that they were slow to innovate due to a lack of skilled labour, while 27% of firms in overall manufacturing reported this as an obstacle.**

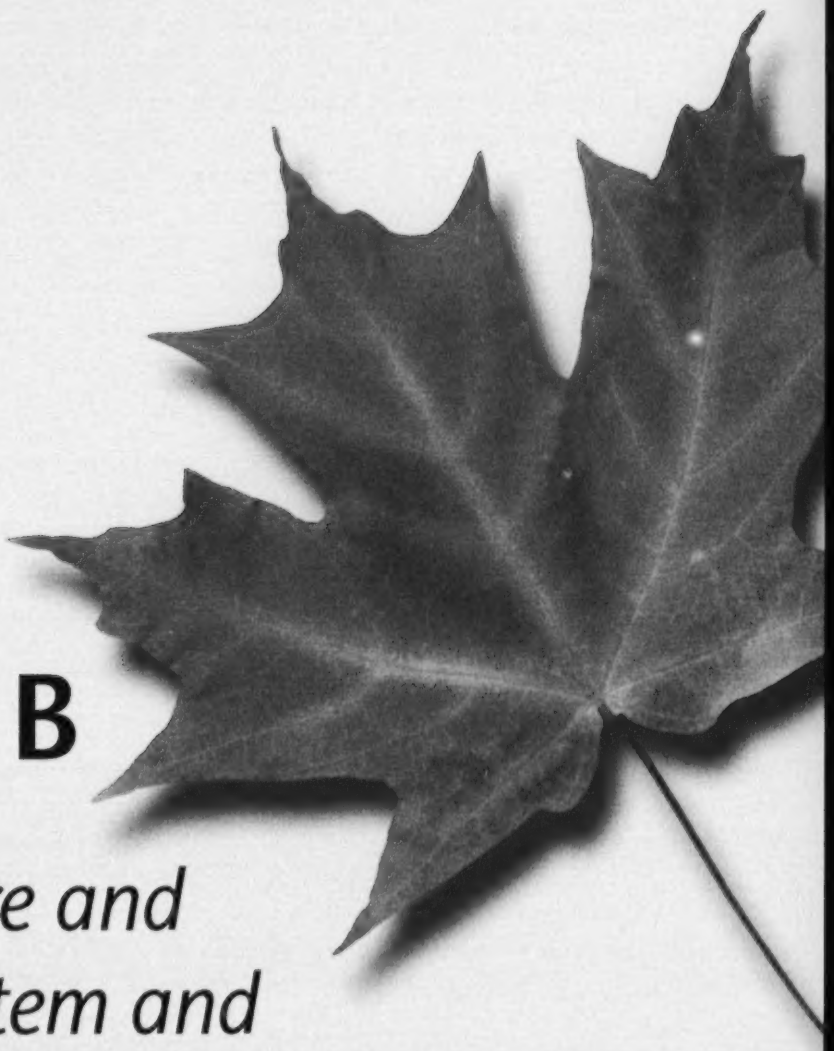
  By sub-industry, firms in the fruit and vegetable preserving and animal food manufacturing sub-industries reported this as an obstacle, at rates comparable to the food processing industry as a whole.

  However, 33% of dairy processors and 34% of meat processing firms claimed that the lack of skilled workers was an obstacle. More of these firms reported skill shortages as an obstacle to innovation than the rest of the food processing and total manufacturing industries.

Chart A1.17
Percent of Enterprises that Faced Obstacles to Innovation Due to a Lack of Skilled Workers by Food Processing Sub-Industry 2009



Source: Statistics Canada, Survey of Innovation and Business Strategy 2009.



Section B

The Agriculture and Agri-Food System and the Canadian Economy

SECTION B1

GDP and Employment

INTRODUCTION:

The Canadian agriculture and agri-food system is a complex and integrated supply chain of importance to the Canadian economy. It makes significant direct and indirect contributions to Canadian Gross Domestic Product (GDP) and employment, and its importance varies by province.

In 2010, GDP and employment in the agriculture and agri-food system continued to grow as the overall economy rebounded after the economic recession of 2009. Employment in all sectors of the system were up, particularly foodservice which had declined during the recession of 2009.

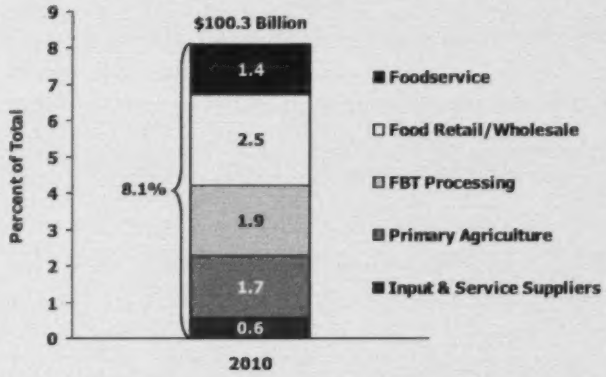
The agriculture and agri-food system plays a significant role in the Canadian economy

- **The Canadian agriculture and agri-food system accounted for about 8.1% of total Canadian Gross Domestic Product (GDP) at $100.3 billion. Together, the food system is the third-largest contributor to national GDP after the finance sector and all other manufacturing industries.**

  The food retail/wholesale industry accounted for the largest share of the agriculture and agri-food system's GDP (2.5%) at $31 billion, followed by food, beverage and tobacco (FBT) processing (1.9%) at $24 billion.

  Primary agriculture accounted for about 1.7% of national GDP at $20.8 billion, while input suppliers accounted for another 0.6% of the total at $7 billion. Foodservice accounted for the remainder at 1.4% of GDP or $17.4 billion.

Chart B1.1
Agriculture and Agri-Food System's Contribution to GDP
2010



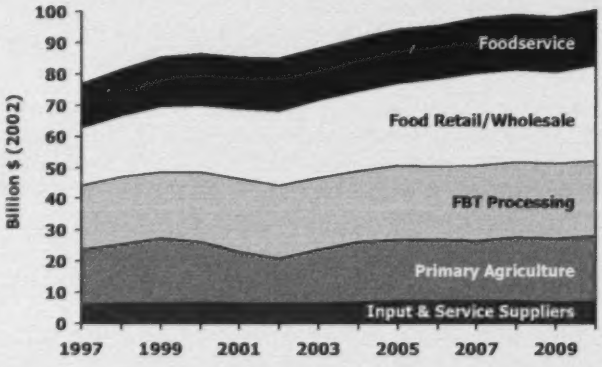
Source: Statistics Canada and AAFC calculations.
Note: 2010 data is preliminary.

- **Since 1997, the overall agriculture and agri-food system has been growing at an average annual rate of 2.4%, which is below the 3% growth rate of the overall economy.**

  Food retail/wholesale is the fastest growing component, with an average annual growth rate of 4.9%, despite the fact that it slowed during the recession of 2009. Primary agriculture and FBT processing GDP grew, on average, by 1.5% and 1.3% per year, respectively.

  In 2010, the system's GDP was up as the food retail/wholesale and foodservice industries resumed their growth after the recession of 2009.

Chart B1.2
Agriculture and Agri-Food System's Contribution to GDP
1997-2010



Source: Statistics Canada and AAFC calculations.
Note: 2010 data is preliminary.

NOTE(S):

See Glossary for definition of the agriculture and agri-food system and sector.

It also makes an important contribution to overall Canadian employment

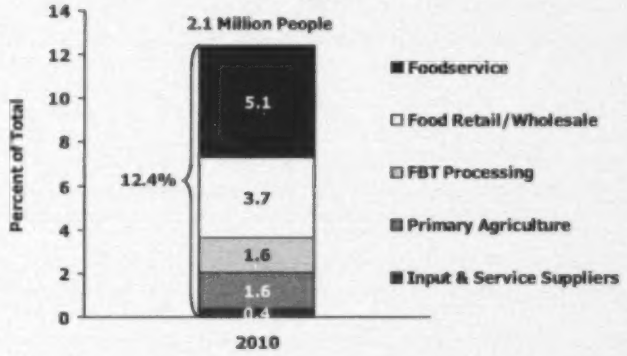
- **In 2010, the Canadian agriculture and agri-food system provided one in eight jobs, employing over 2 million people, to account for 12% of total employment.**

  Primary agriculture and food processing each accounted for about 1.6% of employment in Canada, employing 277,500 and 273,200 workers, respectively.

  Foodservice was the largest contributor, at 5.1%, followed by the food retail/wholesale sectors at almost 4%, employing 867,400 and 628,500 workers, respectively.

  In 2010, the share of employment at food retail stores was more than double the share of food processing and primary agriculture combined.

Chart B1.3
Agriculture and Agri-Food System's Contribution to Employment
2010



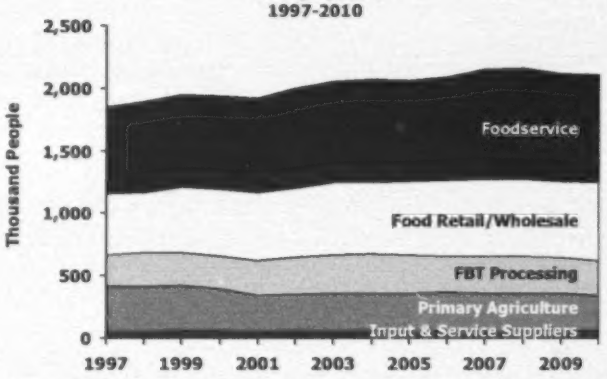
Source: Statistics Canada and AAFC calculations.

- **Employment in the agriculture and agri-food system has been increasing slowly by about 1% per year, so it is now up about 14% from 1997. Overall employment in Canada grew by 24% between 1997 and 2010.**

  Following the general trend in the rest of the economy, the foodservice and retail components of the chain each employed over 25% more people than they did in 1997.

  Also over this period, employment in primary agriculture fell by more than 1% per year. Employment in food processing increased, but not by as much as the service-related sectors.

Chart B1.4
Agriculture and Agri-Food System's Contribution to Employment
1997-2010



Source: Statistics Canada and AAFC calculations.

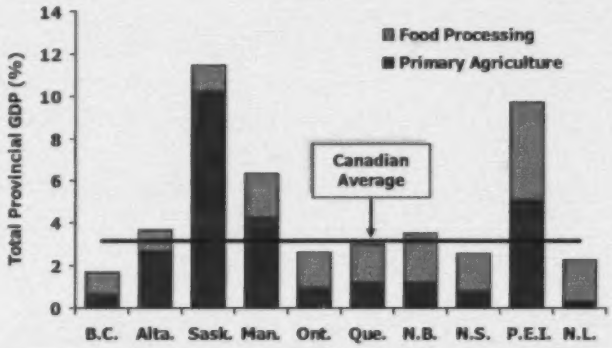
The agriculture and agri-food sector is an important source of economic activity in most provinces

- **In terms of contribution to total provincial GDP, the agriculture and food processing industries play the largest roles in Saskatchewan and Prince Edward Island, accounting for 11.5% and 9.7% of provincial GDP, respectively, in 2010.**

  The mix between primary agriculture and food processing also varies across provinces. East of Manitoba (except for Prince Edward Island), food processing accounts for the larger share of provincial GDP.

  On the Prairies, primary agriculture plays a more dominant role in the agriculture and agri-food sector.

Chart B1.5
Agriculture and Food Processing Industries' Contribution to Provincial GDP
2010

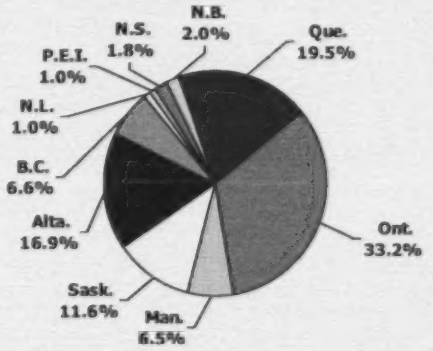


Source: Statistics Canada and AAFC calculations.
Note: Excludes beverage and tobacco processing. 2010 data is preliminary.

- **The provincial contribution to total Canadian agriculture and food processing sector GDP varies across Canada.**

  In 2010, these industries in Ontario, Quebec and Alberta accounted for almost 70% of the total Canadian agriculture and food processing GDP.

Chart B1.6
Provincial Contribution to Total Canadian Agriculture and Food Processing GDP
2010



Source: Statistics Canada and AAFC calculations.
Note: Excludes beverage and tobacco processing. 2010 data is preliminary.

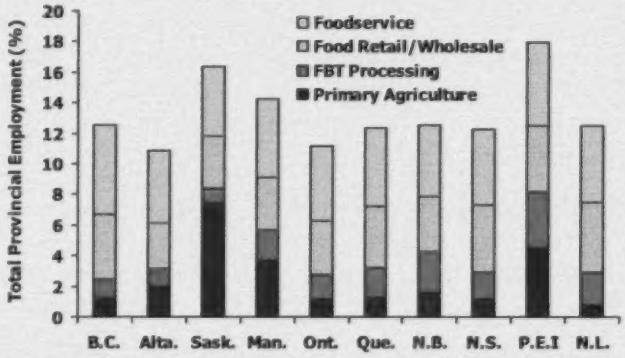
The agriculture and agri-food system is also a major employer in most provincial economies

- **In 2010, the agriculture and agri-food system accounted for the largest share of provincial employment in Prince Edward Island and Saskatchewan at 18% and 16%, respectively.**

  In most provinces, employment in foodservice accounts for the largest share of total employment in the agriculture and agri-food system, followed by food retailing/wholesaling.

  The exception was Saskatchewan, where primary agriculture accounted for the largest share of provincial employment. In Prince Edward Island and Manitoba, primary agriculture was the second most important employer after foodservice.

Chart B1.7
Agriculture and Agri-Food System's Share of Provincial Employment
2010



Source: Statistics Canada and AAFC calculations.

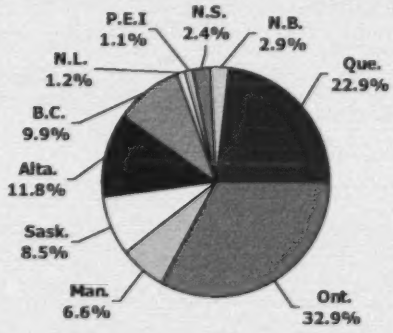
Note: Provincial input and service suppliers have been excluded because of confidentiality with many of its component industries.
2010 data is preliminary.

- **Ontario and Quebec accounted for the largest share of employment in the agriculture and agri-food system.**

  In 2010, Ontario and Quebec accounted for 55% of total Canadian agriculture and food processing employment, followed by Alberta at almost 12%.

  While overall employment rose across the country, the number of workers in the agriculture and food processing industries fell in all provinces in 2010.

Chart B1.8
Provincial Contribution to Total Canadian Agriculture and Food Processing Employment
2010



Source: Statistics Canada and AAFC calculations.

Note: Excludes beverage and tobacco processing.
2010 data is preliminary.

SECTION B2

International Trade

INTRODUCTION:

In 2010, overall Canadian import and export values of agriculture and agri-food products were similar to those reported in 2009. In general, Canadian import and export prices were lower in 2010 than in 2009 and volumes were higher. While the U.S. continues to be Canada's most important trading partner, new export growth opportunities have emerged over the past decade in other markets such as China, which has become a major export market for oilseeds and oilseed products. On the import side, Canadian consumers continue to have access to a wider range of products than those produced domestically, a fact highlighted by the diversity of imports in 2010. (Note that Canadian import and export data in this chapter is current as of August 2011.)

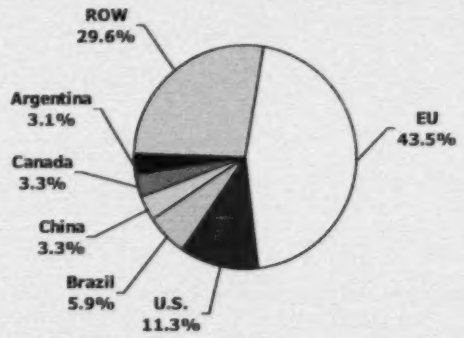
Canada is an important player in the international trade of agriculture and agri-food products

- **Canada, with export sales of $35.5 billion, accounted for 3.3% of the total value of world agriculture and agri-food exports in 2010.**

  Canada was the fifth-largest exporter after the EU, the U.S., Brazil and China in 2010.

  China overtook Canada as the world's fourth largest agriculture and agri-food exporter in 2010.

Chart B2.1
World Agriculture and Agri-Food Export Share by Country of Origin 2010

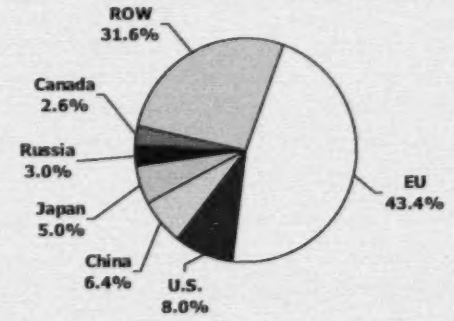


Source: Global Trade Atlas and AAFC calculations.
Note: 1) Excludes all seafood (fresh and processed).
2) Includes intra-EU trade.

- **With $28 billion in imports, Canada accounted for 2.6% of the total value of world agriculture and agri-food imports in 2010.**

  Canada was the world's sixth-largest importer after the EU, the U.S., China, Japan and Russia.

Chart B2.2
World Agriculture and Agri-Food Import Share by Country of Destination 2010



Source: Global Trade Atlas and AAFC calculations.
Note: 1) Excludes all seafood (fresh and processed).
2) Includes intra-EU trade.

NOTE(S):

Note that for much of this chapter, the twenty-seven current members of the EU have been grouped for convenience. Data as of August, 2011.

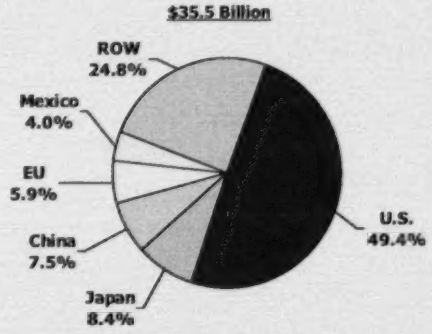
The U.S. continues to be Canada's most important export destination, although other markets are also important

- **In 2010, the U.S. purchased half of the value of all Canadian agriculture and agri-food exports.**

  The other four major export destinations included Japan, China, the EU and Mexico, accounting for one-quarter of Canadian exports. One hundred and sixty countries accounted for the remainder of all export sales.

  Canada's export dependence on the U.S. fell from its peak of 67.2% in 2002 to 49.4% in 2010.

Chart B2.3
Destinations of Canadian Agriculture and Agri-Food Exports
2010



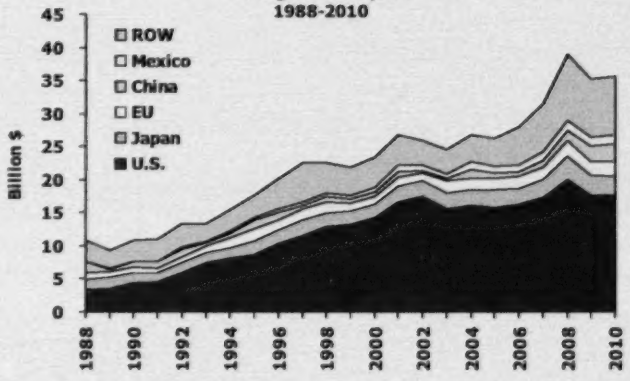
Source: Statistics Canada and AAFC calculations.

- **Canadian export values grew between 1988 and 2010 due to an increase in exports to both U.S. and non-U.S. markets.**

  Exports to the U.S. grew by $14.2 billion (420%) between 1988 and 2010. Over the same period, exports to non-U.S. markets grew by $10.4 billion (139%).

  The value of exports in 2010 were unchanged from those in 2009 primarily due to lower prices.

Chart B2.4
Destinations of Canadian Agriculture and Agri-Food Exports
1988-2010



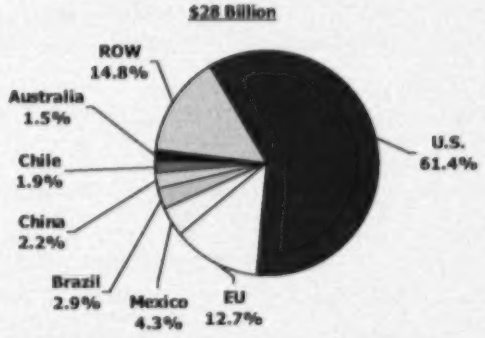
Source: Statistics Canada and AAFC calculations.

Similarly, the U.S. remains Canada's most important source of agriculture and agri-food imports

- **Imports from the U.S. accounted for 61.4% of the value of agriculture and agri-food products imported by Canada in 2010.**

  The EU, Mexico, Brazil, China, Chile and Australia together accounted for roughly one-quarter of all import sales.

Chart B2.5
Origins of Canadian Agriculture and Agri-Food Imports
2010



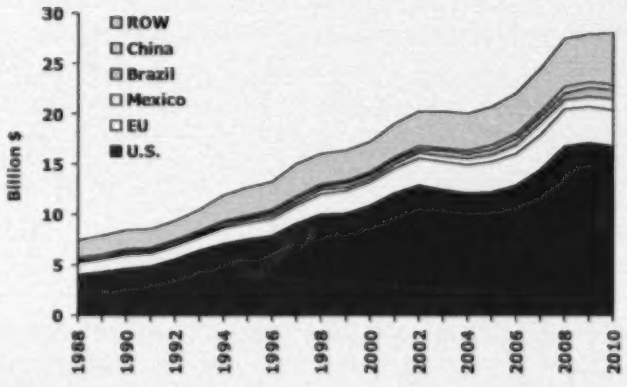
Source: Statistics Canada and AAFC calculations.

- **Imports from the U.S. grew from $4 billion in 1988 to $16.7 billion (316%) in 2010. The value of U.S. imports averaged roughly 60% of the total for most of this period.**

  The EU was also an important source of imports, with the value of imports tripling over the entire period to $3.6 billion.

  Nearly half of the value of imports from the EU in 2010 was accounted for by alcoholic beverages, including wine and beer. Imports from the U.S. were much more varied.

Chart B2.6
Origins of Canadian Agriculture and Agri-Food Imports
1988-2010



Source: Statistics Canada and AAFC calculations.

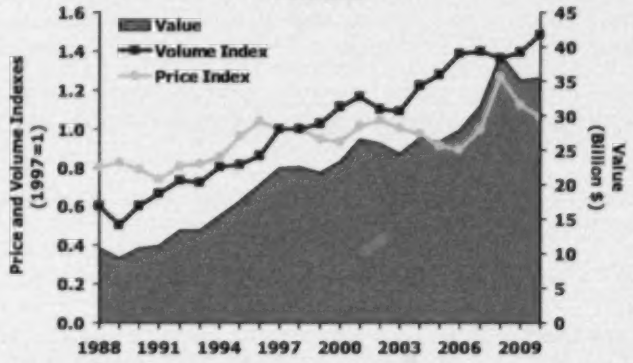
Import and export values in 2010 remained relatively unchanged from 2009, as lower export prices offset higher volumes

- **Export values of agriculture and agri-food products rose from $10.9 billion in 1988 to $35.5 billion in 2010 (226%). This is only slightly higher than the $35.2 billion reported in 2009.**

  Export prices fell dramatically in 2010 from a record peak in 2008. Export volumes continued to rise, thereby offsetting lower export prices and leaving export values relatively unchanged in 2010.

  Growth in export volumes contributed to export value growth over much of the past two decades. Higher export prices contributed to a rapid rise in export values in the mid- to late-2000s.

Chart B2.7
Canadian Agriculture and Agri-Food Exports
(Price and Volume Indexes)
1988-2010



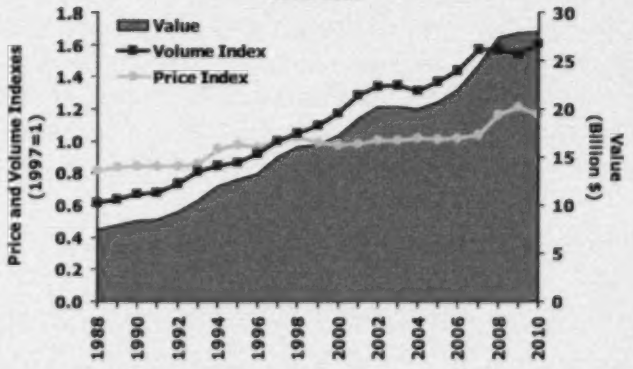
Source: Statistics Canada and AAFC calculations.

- **The total value of agriculture and agri-food imports grew steadily from $7.5 billion in 1988 to $28 billion in 2010 (274%), with imports unchanged from 2009.**

  As with exports, a rise in import volumes offset the slight decline in import prices between 2009 and 2010.

  Import values have grown alongside import volumes for most of the past two decades.

Chart B2.8
Canadian Agriculture and Agri-Food Imports
(Price and Volume Indexes)
1988-2010



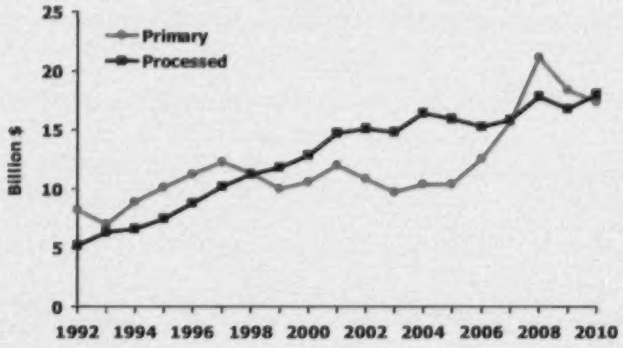
Source: Statistics Canada and AAFC calculations.

While trade in processed food products has grown steadily over time, much of the recent growth in export values occurred in primary agriculture products

- **Canadian agriculture and agri-food exports of primary products increased from $8.2 billion to $17.4 billion between 1992 and 2010. The 2010 value was down slightly from the $18.4 billion reported in 2009 and more sharply from the high of $21.1 billion reported in 2008, when global commodity prices peaked. This is still well above the $12.5 billion reported in 2005.**

  Exports of processed products increased from $5.2 billion in 1992 to $18.1 billion in 2010. This was an increase from $16.8 billion in 2009.

Chart B2.9
Canadian Exports of Primary and Processed Agriculture and Agri-Food Products 1992-2010



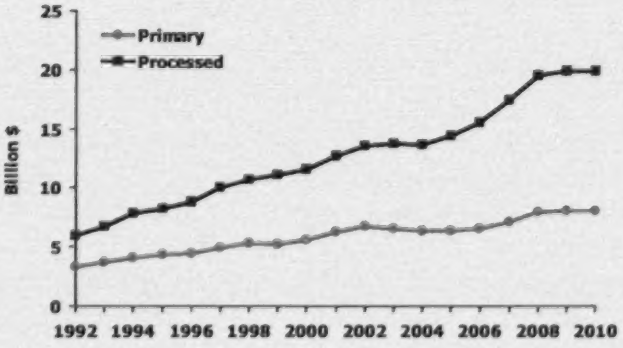
Source: Statistics Canada and AAFC calculations.

- **The value of processed imports has grown at a faster pace than that of primary imports over the past two decades. Import sales of processed products to Canada rose from $6 billion in 1992 to $19.9 billion in 2010.**

  Import sales of primary products rose from $3.3 billion to $8.1 billion over the same period.

  Import values for both primary and processed products remained unchanged between 2009 and 2010.

Chart B2.10
Canadian Imports of Primary and Processed Agriculture and Agri-Food Products 1992-2010



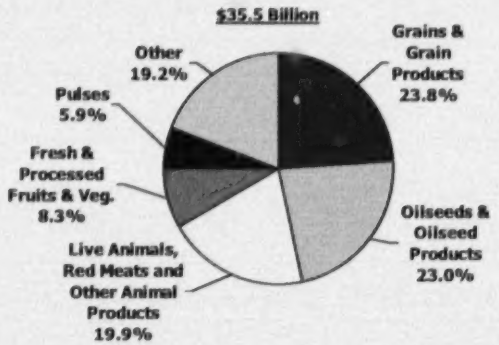
Source: Statistics Canada and AAFC calculations.

Two-thirds of all Canadian agriculture and agri-food exports fall into three main commodity groupings

- **Of the $35.5 billion in Canadian agriculture and agri-food exports in 2010, grains and grain products accounted for 23.8%, followed by oilseeds and oilseed products at 23% and live animals, red meats and other animal products at 19.9%.**

  Other large export categories included fresh and processed fruits and vegetables (including fruit juices) (8.3%) and pulses (5.9%).

Chart B2.11
Commodity Composition of Canadian Agriculture and Agri-Food Export Sales
2010


$35.5 Billion
Grains & Grain Products 23.8%
Oilseeds & Oilseed Products 23.0%
Live Animals, Red Meats and Other Animal Products 19.9%
Fresh & Processed Fruits & Veg. 8.3%
Pulses 5.9%
Other 19.2%

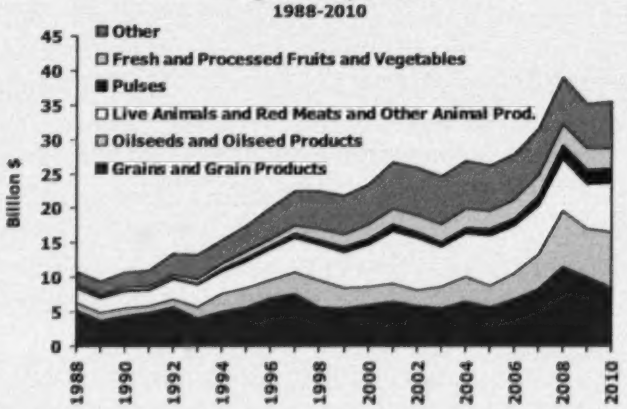
Source: Statistics Canada and AAFC calculations.

- **There has been considerable diversification away from grains and grain products over the past two decades.**

  In 1998, for example, grains and grain products accounted for nearly half of the value of all Canadian agriculture and agri-food exports, compared to roughly one-quarter in 2010.

  Exports of pulses increased at least twelve-fold since 1988. Exports of oilseeds and oilseed products and exports of fresh and processed fruits and vegetables increased nearly six-fold over the same period.

Chart B2.12
Commodity Composition of Canadian Agriculture and Agri-Food Export Sales
1988-2010



Source: Statistics Canada and AAFC calculations.

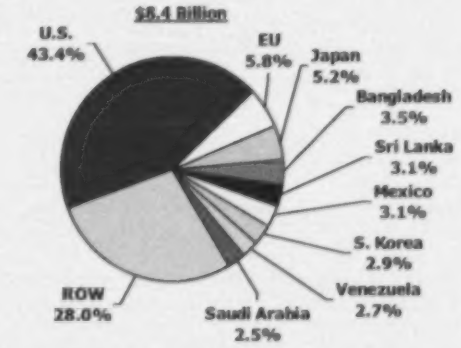
The value of Canadian grains and grain product exports declined in 2010 as export prices fell

- **Canadian grains and grain products are exported to a very diverse set of markets.**

  The U.S. is the major market, accounting for 43.4% of export sales, followed by the EU (5.8%) and Japan (5.2%).

  By value, wheat accounted for 47% of grains and grain product exports, bakery products for 20%, and durum wheat, for 8%.

Chart B2.13
Canadian Grains and Grain Product Exports
by Country of Destination
2010



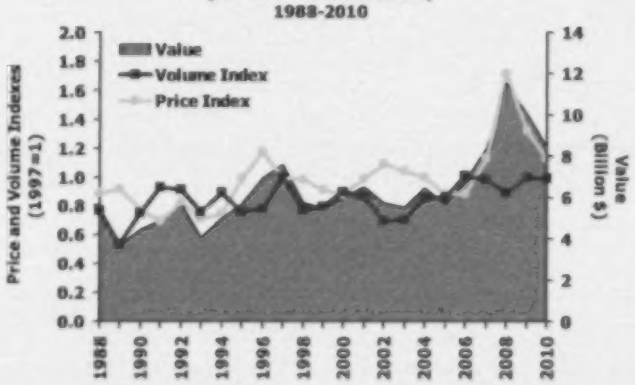
Source: Statistics Canada and AAFC calculations.

- **While export prices of grains and grain products were below their peak in 2008, they remained high relative to prices throughout the 1990s and early 2000s.**

  Export volumes of grains and grain products, while quite variable from one year to the next, still varied little around a constant average.

  The value of exports reached $10 billion in 2009, lower than the $11.5 billion in 2008, but well above export values in previous years.

Chart B2.14
Canadian Grains and Grain Product Exports
(Price and Volume Indexes)
1988-2010



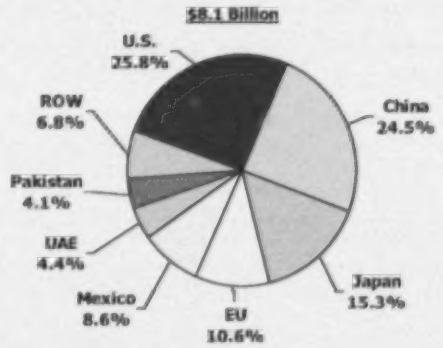
Source: Statistics Canada and AAFC calculations.

The export value of oilseeds and oilseed products increased in 2010, with sales to China approaching the value of sales to the U.S.

- **The U.S. and China were Canada's largest export markets for oilseeds and oilseed products in 2010, accounting for 25.8% and 24.5% of export sales, respectively.**

  By export value, the largest items in this category included canola (42%), canola oil (27%), soybeans (16%) and oilcakes and meals (7%).

Chart B2.15
Canadian Oilseeds and Oilseed Product Exports by Country of Destination
2010



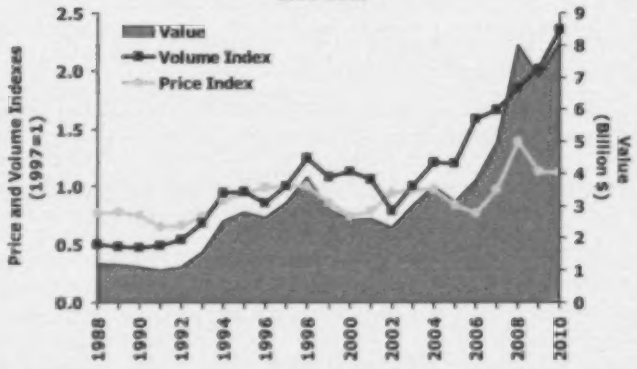
Source: Statistics Canada and AAFC calculations.

- **Relatively stable export prices and a rapid increase in export volumes contributed to a steep rise in export values of oilseeds and oilseed products to $8.1 billion in 2010, up from $7.9 billion in 2009.**

  Relatively rapid growth in export volumes over much of the past decade, and higher prices since 2006 have contributed to growth in export values over time.

  Growth in export values in 2010 occurred mainly to countries such as the Netherlands, the UAE, Mexico and Pakistan. Canadian canola seed exports to China declined in 2010 after China advised Canada that it would restrict Canadian shipments of canola found to contain black leg fungus, a fairly common disease in canola. However, the decline in seed export sales to China was offset by increased sales of canola oil and canola meal resulting in overall oilseeds and oilseed product sales to China of $2 billion, the same value as in 2009. Exports to the U.S. also remained unchanged between 2009 and 2010 at $2.1 billion.

Chart B2.16
Canadian Oilseeds and Oilseed Product Exports (Price and Volume Indexes)
1988-2010

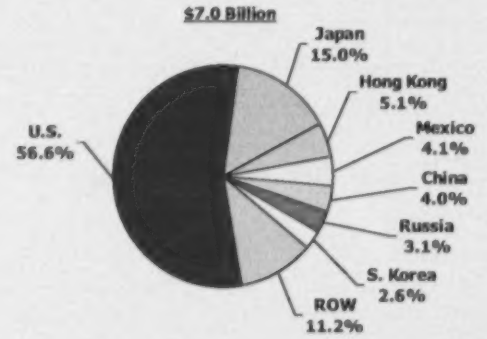


Source: Statistics Canada and AAFC calculations.

Higher export prices and export volumes contributed to the growth in the value of live animals, red meats and other animal product exports in 2010

- **The U.S. was Canada's largest export market for these products in 2010, accounting for 56.6% of sales. This was followed by Japan (15%), Hong Kong (5.1%) and Mexico (4.1%).**

Chart B2.17
Canadian Live Animals, Red Meats and Other Animal Product Exports by Country of Destination 2010



Source: Statistics Canada and AAFC calculations.

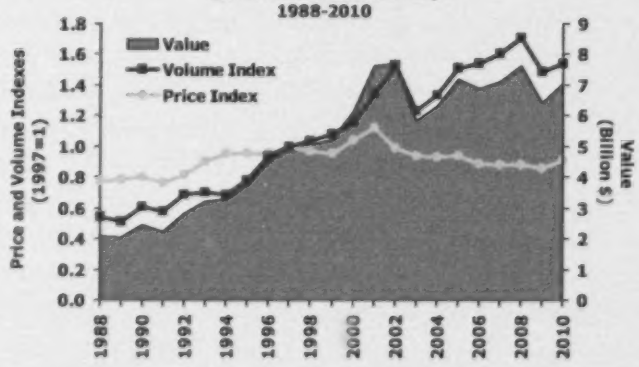
- **Higher export prices and volumes contributed to growth in export values of live animals, red meats and other animal products between 2009 and 2010. This was a reversal from the steep decline in export values observed in 2009.**

  Border restrictions in the U.S. on the flow of live cattle in 2003 due to Bovine Spongiform Encephalopathy (BSE) and a reduction in exports to the U.S. in 2009, with the introduction of Country of Origin Labelling (COOL), have contributed to greater volatility in export volumes in recent years.

  Export prices have been on a slight downward trend since the peak in 2001.

  The increase in total exports in 2010 was mainly due to higher red meat exports to the U.S. and Russia and increased exports of other animal products, such as furs, hides, skins and animal fats and oils to Hong Kong, China and Japan.

Chart B2.18
Canadian Live Animals, Red Meats and Other Animal Product Exports (Price and Volume Indexes) 1988-2010



Source: Statistics Canada and AAFC calculations.

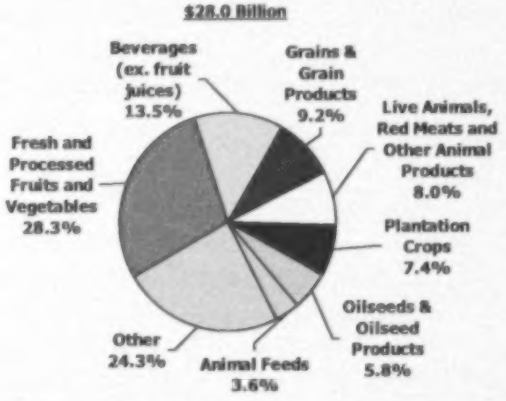
Canada imports a diverse variety of agriculture and agri-food products

- **Imports of fresh and processed fruits and vegetables represented more than one-quarter of total Canadian agriculture and agri-food import sales in 2010.**

  Beverages (13.5%) and grains and grain products (9.2%) were the next-largest categories by import value.

  The commodity composition of imports did not undergo much change from 2009.

Chart B2.19
Commodity Composition of Canadian Agriculture and Agri-Food Import Sales
2010

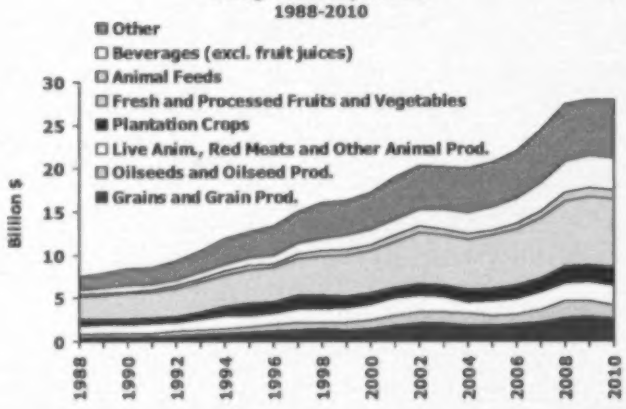

$28.0 Billion
Beverages (ex. fruit juices) 13.5%
Grains & Grain Products 9.2%
Live Animals, Red Meats and Other Animal Products 8.0%
Plantation Crops 7.4%
Oilseeds & Oilseed Products 5.8%
Animal Feeds 3.6%
Other 24.3%
Fresh and Processed Fruits and Vegetables 28.3%

Source: Statistics Canada and AAFC calculations.

- **Growth in the value of imports has occurred in several categories, with the largest growth seen in fresh and processed fruits and vegetables and beverages (excluding fruit juices).**

  The "other" category, which also exhibited growth, is composed of a wide variety of products. Confectionery products and food ingredients, such as sauces and spices, make up a large and growing component of this category.

Chart B2.20
Commodity Composition of Canadian Agriculture and Agri-Food Import Sales
1988-2010



Source: Statistics Canada and AAFC calculations.

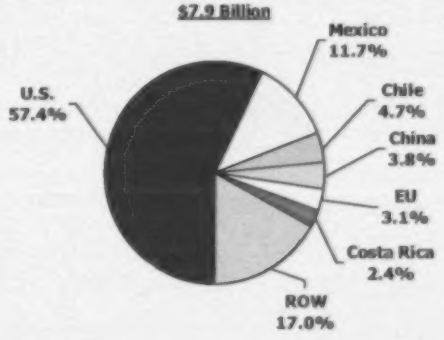
Fresh and processed fruits and vegetables are the largest Canadian import category by value

- **In 2010, $7.9 billion worth of fresh and processed fruits and vegetables was imported into Canada. This figure was unchanged from 2009.**

  The U.S. was Canada's largest import source, accounting for 57.4% in 2010. Mexico was the second-largest source at 11.7%.

  Fresh berries were the largest item by value, accounting for 8% of the total, followed by fruit juices (7.6%) and other fresh fruits and nuts (7.5%).

Chart B2.21
Canadian Fresh and Processed Fruits and Vegetable Imports by Country of Origin
2010

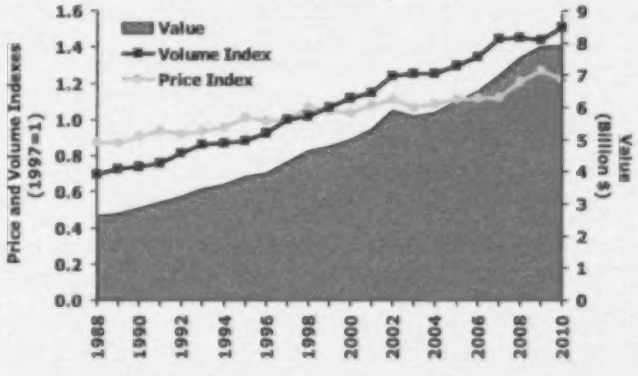


Source: Statistics Canada and AAFC calculations.
Note: Includes fruit juices and other processed items.

- **Higher import volumes in 2010 were offset by lower import prices, leaving import values relatively unchanged from 2009.**

  Steady growth in import volumes and somewhat slower growth in import prices contributed to steady growth in the import value of fresh and processed fruits and vegetables over most of the past two decades.

Chart B2.22
Canadian Fresh and Processed Fruits and Vegetable Imports (Price and Volume Indexes)
1988-2010



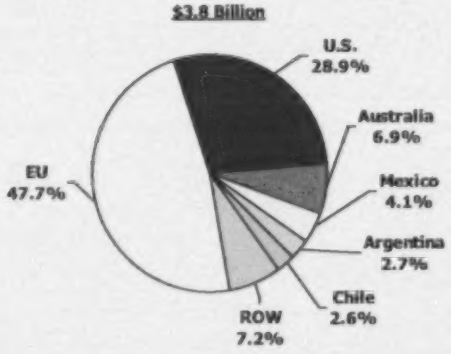
Source: Statistics Canada and AAFC calculations.
Note: Includes fruit juices and other processed items.

The value of Canadian beverage imports has increased steadily over the past two decades

- **The EU and the U.S. supplied over 75% of all beverage imports (excluding fruit juices) by value to Canada in 2010.**

  The largest imports by value were wine (45%), distilled beverages (18%) and beer (17%). Mineral water and other non-alcoholic beverages (excluding fruit juices) accounted for another 18%.

Chart B2.23
Canadian Beverage Imports by Country of Origin
2010

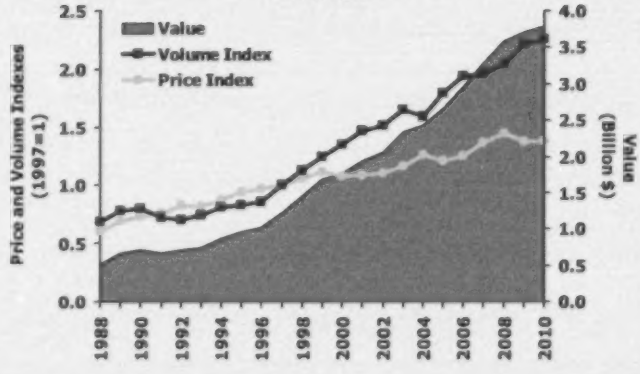


Source: Statistics Canada and AAFC calculations.
Note: Excludes fruit juices.

- **The value of Canadian beverage imports increased from $504 million in 1988 to $3.8 billion in 2010.**

  While the rate of growth in import prices remained relatively constant over the entire period, the rate of growth in import volumes picked up in the late 1990s, contributing to greater growth in import values.

Chart B2.24
Canadian Beverage Imports
(Price and Volume Indexes)
1988-2010



Source: Statistics Canada and AAFC calculations.
Note: Excludes fruit juices.

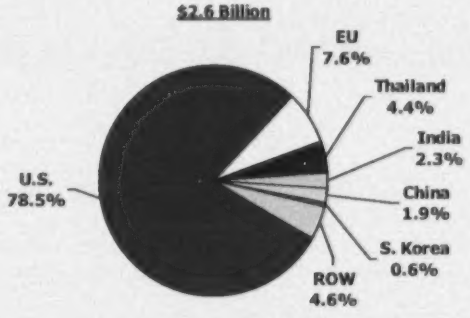
The U.S. is the primary source of Canadian grains and grain product imports

- **The U.S. accounted for more than 75% of all grains and grain product import sales in 2010.**

  Imports from the U.S. were over ten times greater than the next-largest source, the EU.

  The largest item in this category by value is bakery products, such as breads and cakes. The bulk of the remainder consists of processed grains, pasta, rice and corn.

Chart B2.25
Canadian Grains and Grain Product Imports
by Country of Origin
2010



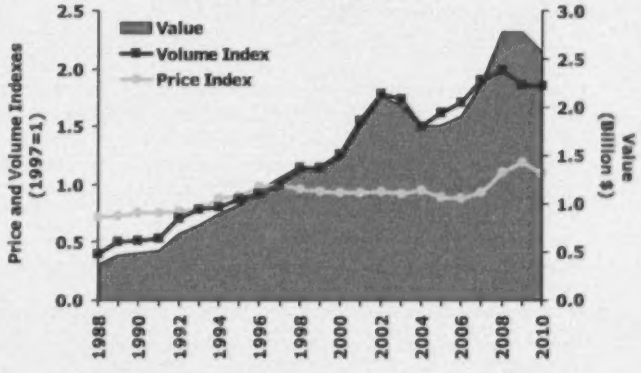
Source: Statistics Canada and AAFC calculations.

- **The value of grains and grain product imports decreased from a peak of $2.8 billion in 2009 to $2.6 billion in 2010.**

  However, Canadian imports of grains and grain products have increased substantially from $363 million in 1988.

  With the exception of a period of higher import prices between 2008 and 2010, most of the growth in import values over the past two decades has been due to growth in import volumes.

Chart B2.26
Canadian Grains and Grain Product Imports
(Price and Volume Indexes)
1988-2010



Source: Statistics Canada and AAFC calculations.

SECTION B3

Productivity and Innovation in the Agriculture, Agri-Food and Agri-Based Products Industries

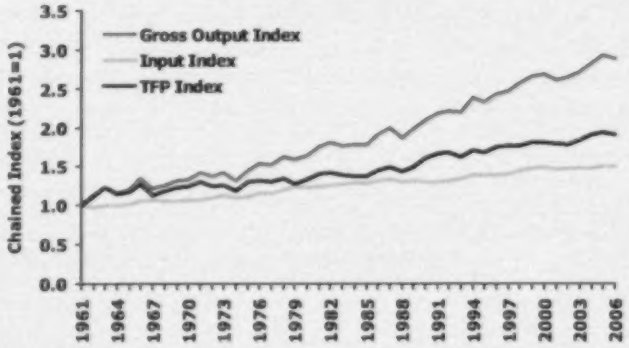
INTRODUCTION:

Innovation is key to the agriculture and agri-food sector's productivity growth and long-term prosperity and sustainability. Innovation introduces new products and processes which, when adopted and/or implemented, can improve the manner in which capital, labour and other inputs are combined, resulting in more efficient production or higher returns via new products. Investments in research and development (R&D) as well as technological improvements contribute to improved productivity growth, which is important as the sector adapts to global challenges and responds to competitive pressures and changing consumer demands in global and domestic markets.

Total factor productivity (TFP) growth in agriculture contributed more to real economic growth in the Canadian sector than input growth

- **Real economic growth in primary agriculture, measured here as an increase in total gross output, averaged 2.3% annually between 1961 and 2006. Total factor productivity growth, which averaged 1.6% annually, accounted for over two-thirds of this economic growth. Total inputs used in Canadian agriculture, which increased by 0.7% annually, accounted for the remainder.**

Chart B3.1
Gross Output, Input and Total Factor Productivity Growth in Primary Agriculture 1961-2006

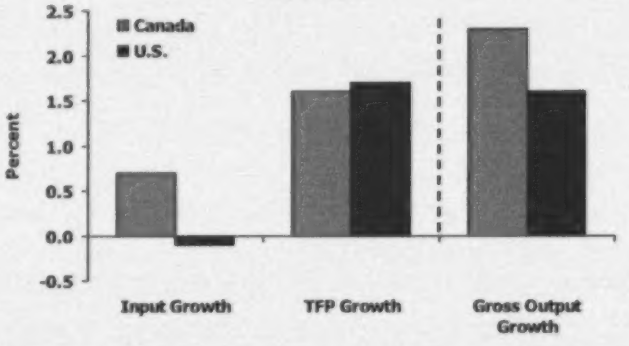


Source: AAFC.

- **TFP growth in Canadian and U.S. primary agriculture was almost the same over the period 1961 to 2006.**

  Average annual TFP growth was 1.6% in Canada and 1.7% in the U.S. over this period. Total inputs used in Canadian agriculture, grew at an average rate of 0.7% annually. This was much higher than in the U.S., where total inputs actually decreased at an average annual rate of -0.1% over the period. The higher rate of total input growth accounts for the difference between the rate of total gross output growth in Canada and the U.S. (2.3% versus 1.6%).

Chart B3.2
Average Annual Contributions of Input and TFP Growth to Gross Output Growth in Canadian and U.S. Primary Agriculture 1961-2006



Source: AAFC and ERS-USDA.

NOTE(S):

Productivity is expressed as total factor productivity (TFP), where TFP is the ratio of total outputs to total inputs. Growth in TFP is referred to as productivity growth and can be thought of as reflecting improvements in technologies and efficiencies in a firm or an industry. The word "total" in the term "total factor productivity" is a recognition that the contributions of all inputs to overall output are accounted for rather than just, say, labour.

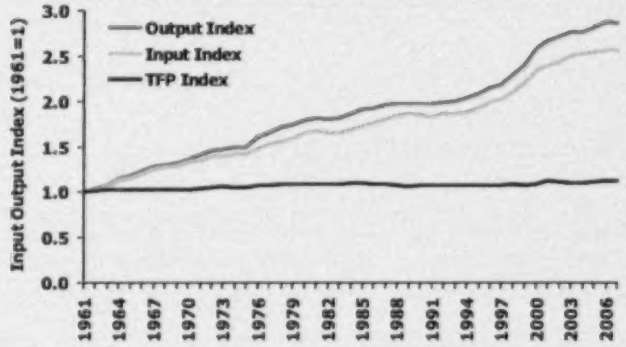
Multifactor productivity (MFP) and total factor productivity (TFP) are often used interchangeably. While MFP relates a change in output to several types of inputs, TFP is said to capture all factors' contribution to output. However defined, productivity is often measured residually as that change in output that cannot be accounted for by the change in combined inputs. (Source: OECD Manual, 2001)

Most of the real economic growth in the food and beverage processing industry has been due to input growth rather than TFP growth

- **In food processing, TFP has grown more slowly, at an average annual rate of 0.2% between 1961 and 2007.**

  Almost all of the growth in output, which grew by an average annual rate of 2.1% over this period, has been due to input growth of 1.9% in the food processing industry.

Chart B3.3
Input, Output and TFP Growth in the Food Processing Industry 1961-2007

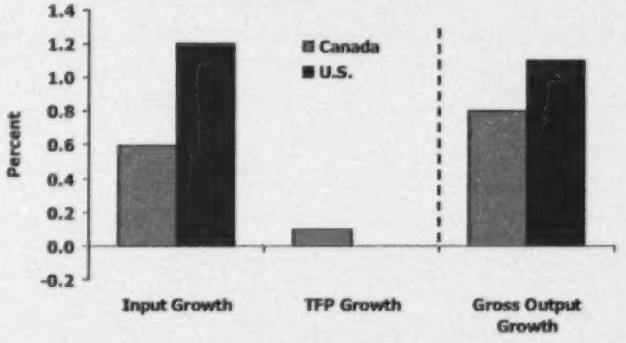


Source: Statistics Canada and AAFC calculations.

- **Low but positive TFP growth in the Canadian food and beverage processing industry has meant higher gross output growth, relative to the U.S. food and beverage processing industry.**

  The Canadian food and beverage processing industry gross output grew by 0.8% per year on average between 1988 and 2007. While most of this growth was due to increases in inputs (which grew almost 1% each year), some was due to low but positive productivity growth (averaging 0.14% annually). The average annual increase in U.S. food and beverage processing industry gross output, at 1.1% per year, was slightly higher than Canada at 0.8%. The difference between the Canadian and U.S. output growth was due to higher input growth and slightly negative productivity growth in the U.S.

Chart B3.4
Average Annual Contributions of Input and TFP Growth to Gross Output Growth in Canadian and U.S. Food and Beverage Processing Industry 1988-2007



Source: Statistics Canada and U.S. Bureau of Labor Statistics.

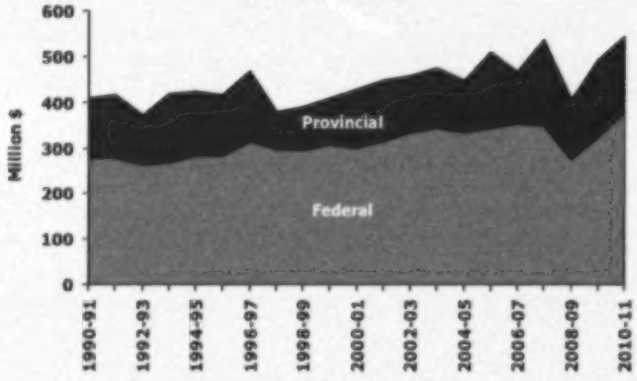
Investments in R&D are widely recognized as an important component in innovation and productivity growth

- **In Canada, publicly-funded R&D expenditures on agriculture and agri-food have been predominantly provided by the federal government.**

  On average, federal expenditures have accounted for 70% of total public research expenditures over the past ten years (2001-02 to 2010-11), with the provinces accounting for the remaining 30%. There has been a gradual increase in total publicly-funded research expenditures on the agriculture and agri-food sector over the last decade, with a peak of $536 million expected in the 2010-11 fiscal year.

  Over the past five years, a larger proportion of public R&D funding is being targeted to encourage partnerships with industry and academia and more applied research results.

Chart B3.5
Government Research Expenditures on Agriculture and Agri-Food
1990-91 to 2010-11

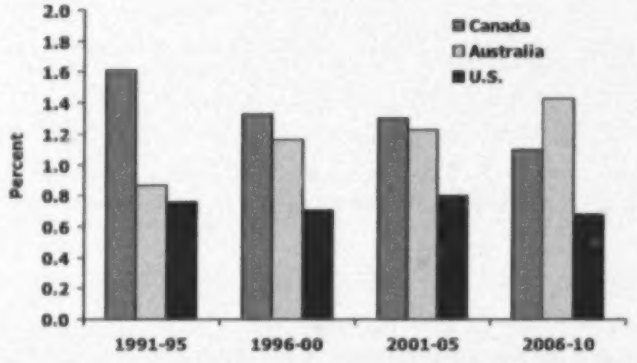


Source: AAFC.
Note: 2010-11 figures are estimates.

- **As a share of gross farm receipts, R&D spending in Canada to support the agriculture and agri-food sector decreased over time, while it increased in Australia and stayed relatively stable in the U.S.**

  For the period 2006-10, public sector R&D, as a share of gross farm receipts, was lower in Canada than in Australia, but higher than in the U.S. This is the first period since 1991-95 that Canada's spending is less than in Australia. The average share in Australia jumped from 0.87% in the 1991-95 period to 1.43% in 2006-10, while the average share in Canada went down from 1.61% to 1.10% for the same respective periods.

Chart B3.6
Public R&D Spending to Support the Agriculture and Agri-Food Sector as a Share of Adjusted Value of Production
1991-95 to 2006-10



Source: OECD, Trade and Agriculture Directorate, Producer and Consumer Support Estimates, OECD Database.
Note: In order to improve comparability and consistency across countries, the OECD is currently undertaking a study that will review its methodology for classifying these expenditures.

NOTE(S):

Innovation in the agriculture, agri-food and agri-based products sector is a process that generates new knowledge and develops or adapts new or improved products, processes or practices that are implemented or adopted to add value to farms, firms or the sector.

Innovation is a complex process within a dynamic system of diverse players, from foreign direct investors to financial institutions, universities and colleges, non-profit research institutions, private business and governments. It includes diverse interactions between farms, firms or institutions whose activities can range from invention, investing, commercializing or adopting innovations or oversight functions such as regulatory activities or protecting intellectual property rights.

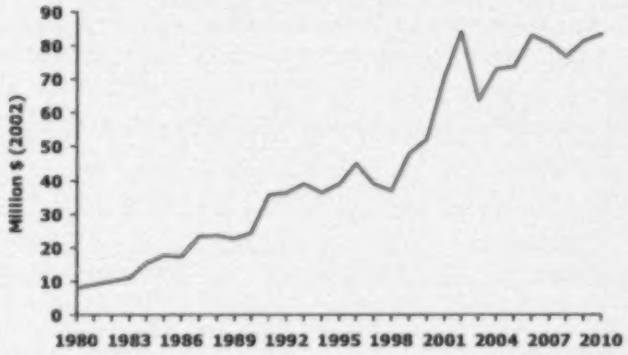
In agriculture, R&D investments by the private sector have been increasing over time due to more joint collaborations between producers, the public and other institutions

- **Private sector R&D investments in agriculture have risen steadily since the 1980s, and have continued to grow through the 1990s after returns on investments were guaranteed through Intellectual Property Rights (IPR) protection on new crop inventions.**

  Real private sector R&D spending in the primary agriculture sector increased significantly between 1998 and 2002, but has slowed more recently. Private sector spending on primary agriculture averaged about $80 million between 2003 and 2010, down from a peak of $84 million in 2002.

  However, this data does not include private R&D expenditures by agricultural input industries, such as chemical or machinery companies, which may be conducting R&D that benefits the agriculture sector.

Chart B3.7
Real Private Sector R&D in Primary Agriculture
1980-2010



Source: Statistics Canada and AAFC calculations.

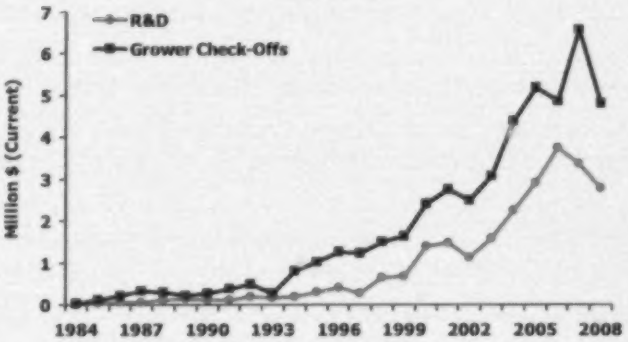
Note: 1) 2008-2010 figures are preliminary.
2) This includes all R&D expenditures (intramural) made by private industry regardless of whether the sources of funds were self-financed, government grants/contracts or from other companies.
3) This includes NAICS 111, 112 (except aquaculture) and 1151, 1152 (support activities).

- **Industry check-offs are becoming common sources of funding for R&D. Check-offs have allowed producers to be able to finance and benefit from private investments in commodity R&D.**

  The primary mechanism for financing the activities of the Saskatchewan Pulse Growers is a grower check-off collected to fund pulse research for the benefit of all growers.

  The total amount derived from check-offs has grown substantially between 1984 and 2008. Annual check-offs averaged $196,000 between 1984 and 1988, and rose to an average of just over $5.1 million between 2004 and 2008.

Chart B3.8
Saskatchewan Pulse Growers R&D Expenditures and Check-Offs
1984-2008



Source: Gray et al., 2008.

Note: 1) Author's calculation based on Saskatchewan Pulse Growers (SPG) expenditure and revenue data.
2) Includes net research and development expenditure plus beginning in 1997 net expenditure on the variety release program.

NOTE(S):

Industry Check-Offs: some producer associations collect levies from grower members for research, development and promotion of agriculture commodities. These arrangements usually involve an annual assessment of marketings or sales, where the revenue is pooled by the grower organization and a percentage share or fixed amount is collected for these purposes.

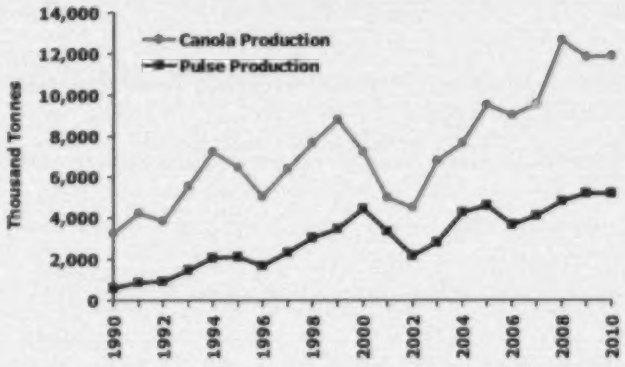
In agriculture, innovation and adoption in both crop and animal production have contributed to long-term productivity growth

- **Innovative improvements in plant genetics and agronomic attributes as well as production practices have led to widespread adoption of new crop varieties in Canada.**

  One such success is canola, which was developed in the 1960s when government scientists collaborated with producers and the Rapeseed Association of Canada. Co-operative research by players within the supply chain resulted in a crop that is well adapted to prairie growing conditions and delivers high-value food oil to markets at home and abroad. Canola production and area seeded are now almost four-times higher than in 1990, at almost 12 million tonnes in 2010.

  Similarly, early agronomic research on the Prairies led to new pulse varieties being adopted for new markets, such as India. The industry continues to position itself through research, funded by check-offs, to take advantage of evolving demands within key markets and other potentially valuable opportunities.

Chart B3.9
Pulse and Canola Production in Canada
1990-2010

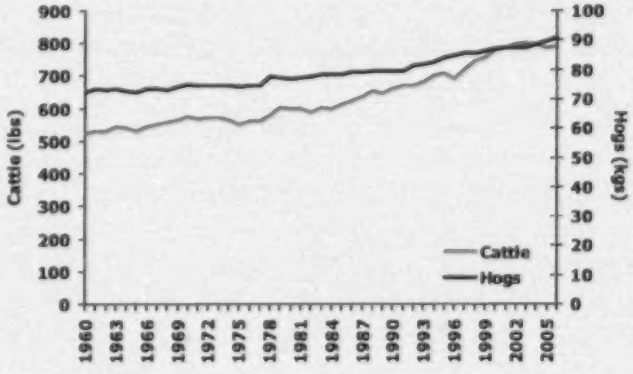


Source: Statistics Canada and AAFC calculations.

- **At the same time, improvements in livestock genetics and feeding regimes have led to higher output per animal.**

  Cattle and hog production have grown steadily over the past three decades. The weight of the average hog carcass has grown by 11 kilograms per animal (almost 20%) since 1980. The average cattle carcass has increased by over 30% over the same period (i.e. almost 200 pounds per animal).

Chart B3.10
Average Weight of Cattle and Hog Carcasses
1960-2006



Source: Canfax and AAFC, various years.

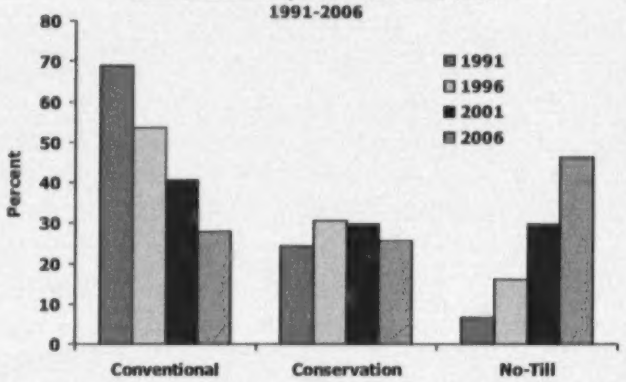
Important innovations in agriculture have also led to the development of beneficial management practices, which are being widely adopted in farm production processes

- **The development of conservation tillage systems has been a major transformative innovation on the Prairies. Farmers have been using these practices to improve environmental performance and reduce costs for the past twenty years.**

  Conservation tillage innovation was the result of close cooperation between producers, researchers (federal, provincial, and university), small farm implement companies and public extension agents.

  The percentage of cropland under no-till has risen to almost 50% of farmland since the 1990s. Adoption rates have been highest in Saskatchewan and Alberta.

Chart B3.11
Percent of Cropland Under Conventional, Conservation and No-Till
1991-2006

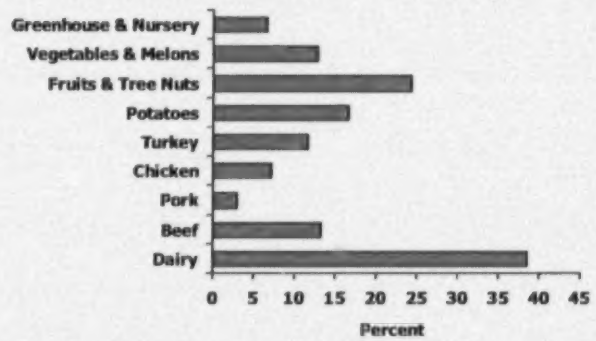


Source: Statistics Canada, Census of Agriculture, various years.

- **Farmers are also adapting to new regulatory requirements and consumer preferences by implementing food safety practices.**

  In 2008, almost 40% of dairy producers surveyed had adopted on-farm food safety practices, the largest share of producers by commodity. Fruit and tree nut producers were the next-largest group to have adopted a form of food safety practice, at 25% of producers in 2008.

Chart B3.12
Percent of Producers Using On-Farm Food Safety Practices by Farm Type
2008



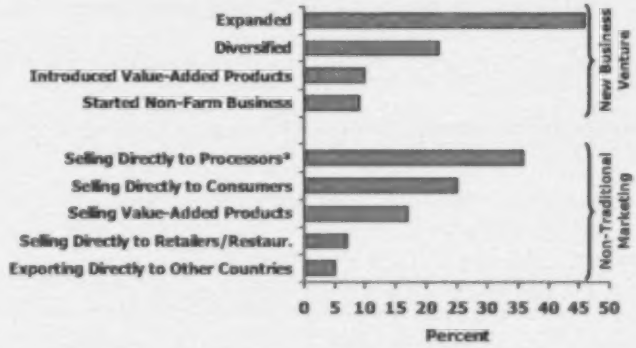
Source: Statistics Canada, Farm Financial Survey, 2008.

Adopting new organizational strategies or implementing non-traditional marketing methods are also important ways in which farmers can innovate

- **The 2007 National Renewal Survey reported that almost half of producers (46%) had pursued a new venture such as an expansion, and just over one-fifth (22%) had diversified their farm business in the five years prior to completing the survey.**

  In 2007, the most common new marketing arrangement introduced in the previous five years was selling directly to processors. Among producers marketing their production in non-traditional ways, many reported the use of production contracts. Traditional marketing methods for many agriculture producers include selling to auction markets, marketing boards, co-operatives or to grain or feed companies.

Chart B3.13
Percent of Farmers Reporting the Adoption of New Organizational Strategies or Business Models
2007

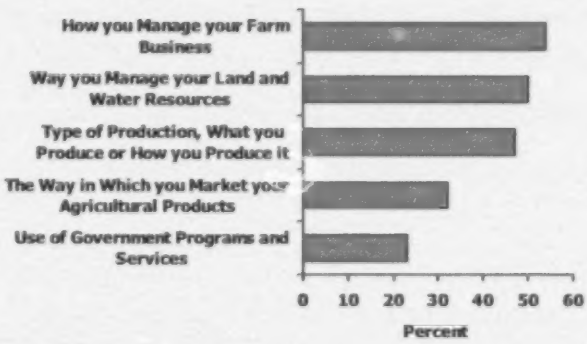


Source: Statistics Canada, National Renewal Survey, 2007.
Note: *Excludes marketing boards.

- **Another recent survey by Ipsos Reid shows that producers innovate by changing the way they do business through a variety of business practices.**

  In 2009, over half of producers surveyed (54%) reported that over the previous two years, they had changed the way they were managing their farm businesses. Around 50% of producers also reported that they were managing their land and water resources differently or producing products differently than two years earlier. Just 32% reported changing the way they marketed their agricultural products.

Chart B3.14
Percent of Producers Reporting Changing Their Management Practices
2009


How you Manage your Farm Business
Way you Manage your Land and Water Resources
Type of Production, What you Produce or How you Produce it
The Way in Which you Market your Agricultural Products
Use of Government Programs and Services
0 10 20 30 40 50 60
Percent

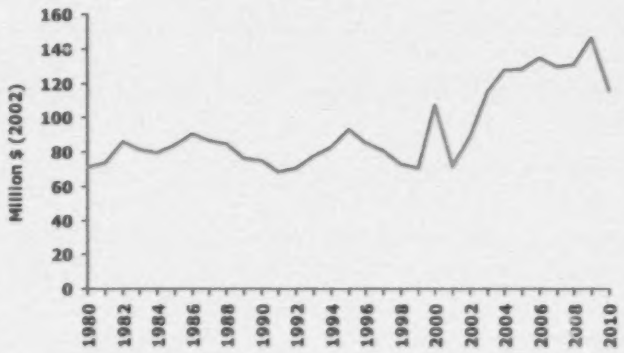
Source: AAFC Strategic Issues Tracking Survey, 2009.

In the Canadian food processing industry, private sector R&D expenditures have been growing since 2002, contributing to innovation and productivity growth in the sector

- **Based on preliminary estimates, the food processing industry's R&D expenditures reached $116 million in 2010, down from $146 million in 2009. R&D spending averaged $80 million between 1980 and 1998.**

  Since 1980, the industry has introduced innovations in food safety and preserving processes (i.e. HACCP and flash freezing) as well as inventory control (i.e. "just in time inventory").

Chart B3.15
Real Private Sector R&D Expenditures in Food Processing
1980-2010



Source: Statistics Canada and AAFC calculations.

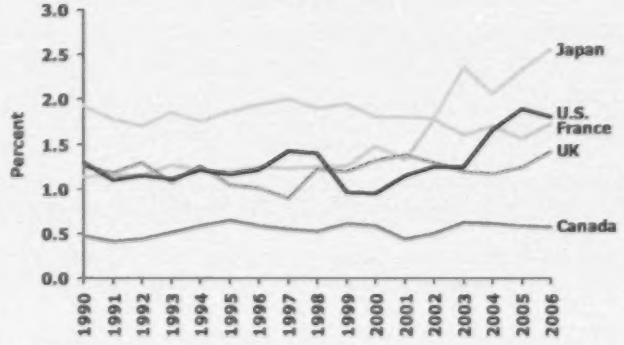
Note: 1) 2008-2010 figures are preliminary.
2) This includes all R&D expenditures (intramural) made by private industry regardless of whether the sources of funds were self-financed, government grants/contracts or from other companies.

- **Relative to other countries, the Canadian food and beverage processing industry tends to invest a much smaller share of its value of production on R&D, especially compared to the U.S. and Japan.**

  The Canadian food and beverage processing industry spent about 0.5% of value-added on R&D, while that in the U.S. allocated about 2% and Japan, 2.4%. Surveys show that less than 50% of food and beverage firms engage in original R&D.

  However, lower R&D intensity in Canada may be due to the fact that R&D investments are taking place in head offices of multinationals outside of Canada, which benefit Canadian subsidiaries. Moreover, Canadian food and beverage processing firms are proficient at modifying technology developed by others outside the country and acquire new technologies through purchasing machinery and equipment from overseas, or benefit from investments made in R&D by supply chain partners (e.g. packagers).

Chart B3.16
Food and Beverage Industry R&D Expenditures as a Share of Value-Added in Selected OECD Countries
1990-2006



Source: OECD, STAN Indicators, 2011.

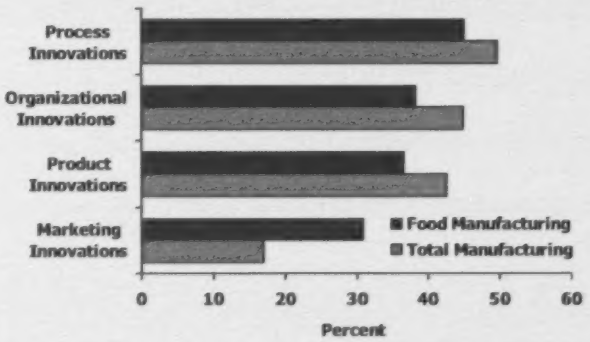
In the food processing industry, innovation also takes place by developing new products or processes, or by implementing new marketing or organizational methods

- **In 2009, 45% of food processors reported introducing process innovations and 37% reported introducing product innovations.**

  Process innovations include improved production processes, distribution methods or support activities, often requiring changes to organizational activities.

  Organizational innovations, which generally comprise knowledge management, workplace organization or external relations, were introduced by 38% of enterprises, followed by just over 31% who reported introducing marketing innovations.

Chart B3.17
Percent of Enterprises Reporting a Process, Product, Organization or Marketing Innovation
2009



Source: Statistics Canada, Survey of Innovation and Business Strategy, 2009.

- **Long-term strategies and business strategies in the food processing industry tend to focus on improving goods and services, marketing practices or methods, operational and business activities and organizational and management practices.**

  Sixty-seven percent of food processors identified their long-term business strategy as being focussed on positioning their goods and services in the market, while 56% were focussed on marketing practices, 53% were focussed on business activities and 59% on organizational and management practices. In general, these shares are higher than for total manufacturing.

Chart B3.18
Percent of Enterprises Reporting the Focus of Their Long-Term Business Strategies
2009

Source: Statistics Canada, Survey of Innovation and Business Strategy, 2009.

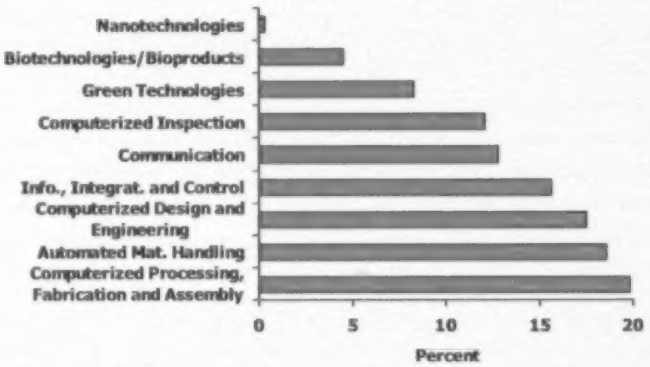
In the food processing industry, an important way to innovate is through adopting advanced technologies usually acquired by purchasing from other enterprises

- **In 2009, the top advanced technology used by food manufacturers was computerized processing, fabrication and assembly as reported by 20% of enterprises.**

  Automated material handling, which includes technologies such as bar coding, ranked second in terms of use reported by 19% of respondents.

  Computerized design and engineering was next in importance at 18% of respondents using computer-aided design, including simulation technologies.

Chart B3.19
Percent of Enterprises Reporting
Using the Following Types of Advanced Technologies
2009



Source: Statistics Canada, Survey of Innovation and Business Strategy, 2009.

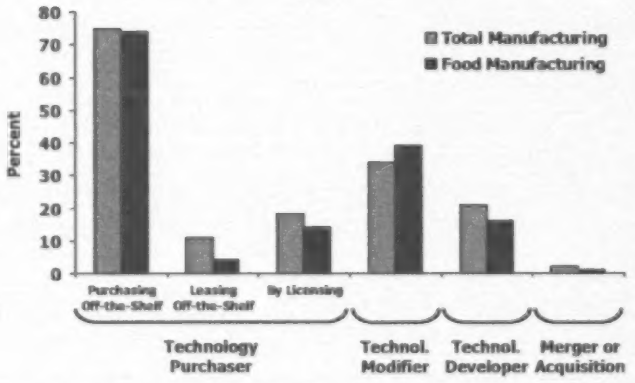
- **Food manufacturers tend to acquire advanced technologies by purchasing technology off-the-shelf, as in-house development is much more costly.**

  Over 70% of food processing establishments reported purchasing off-the-shelf advanced technology as a means of acquiring/integrating that new technology in 2009. This is comparable to total manufacturing.

  Modifying existing technologies is also common in food manufacturing, as 39% of food enterprises reported this method of acquiring technologies.

  By sub-industry, 97% of bakery and tortilla enterprises purchased off-the-shelf technologies, followed by 93% of fruit and vegetable manufacturers. On the other hand, 35% of meat product enterprises developed new advanced technologies as a means of acquisition.

Chart B3.20
Percent of Enterprises Reporting
Acquiring or Integrating Advanced Technologies by Means
2009



Source: Statistics Canada, Survey of Innovation and Business Strategy, 2009.

Uncertainty and risk are reportedly the top obstacles to innovation for food manufacturing enterprises, but most undertook measures to overcome them

- **Forty percent of food processors reported risk and uncertainty as major factors impeding innovation. Eighty-six percent reported that they took measures to overcome these barriers and 40% affirmed that those measures were successful. For 20% of respondents, government support programs played a role in overcoming this obstacle.**

Other obstacles that impeded innovation activities included issues related to internal financing (28%), regulatory issues (28%) and the lack of skills in the workforce (26%). Moreover, regulatory issues and issues related to external collaborators were more important obstacles for the food industry than for the manufacturing sector in general. Regulatory issues ranked highest for dairy processors.

Chart B3.21
Percent of Enterprises Reporting Obstacles to Innovation
2009

Source: Statistics Canada, Survey of Innovation and Business Strategy, 2009.

Innovation is one of the ways in which food processors reported adapting to increased competition in their main market

- **Changing the prices of their products or services was the most important response to new competition. However, innovation and adoption were also key, as was introducing a new good or service.**

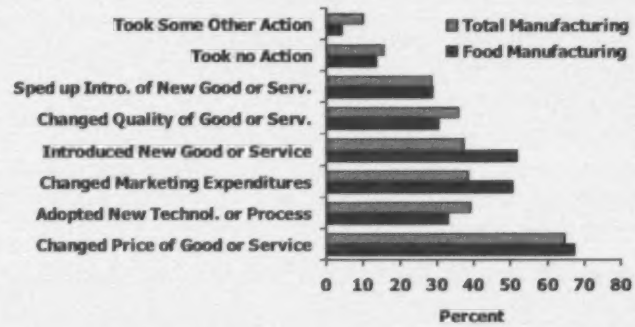
  In 2009, 29% of food processing enterprises reported that new competitors had entered their main market and 58% stated they had to compete directly with more than six firms for their highest-selling product.

  If new competitors entered their market, 67% of food processors reported that they would change the price of their goods or services as a business strategy to compete.

  On the other hand, over 50% of enterprises reported introducing new goods or services or changing their marketing expenditures as popular strategies for responding to increased competition.

  Finally, adopting new technologies or processes or changing the quality of their products were strategies reported by around 30% of respondents in response to new competition.

Chart B3.22
Percent of Enterprises Reporting Changing Competition Practices Following Entry of New Competitors in Main Market
2009


Took Some Other Action
Took no Action
Sped up Intro. of New Good or Serv.
Changed Quality of Good or Serv.
Introduced New Good or Service
Changed Marketing Expenditures
Adopted New Technol. or Process
Changed Price of Good or Service
Total Manufacturing
Food Manufacturing
0 10 20 30 40 50 60 70 80
Percent

Source: Statistics Canada, Survey of Innovation and Business Strategy, 2009.

Bioproduct production and development is an example of a quickly-evolving, innovative, and knowledge-intensive sector in Canada

- **In 2009-10, Canada's bioproducts sector included 208 firms with industrial bioproduct activities. These firms used a total of 2.7 million metric tonnes of biomass to generate bioproducts sales of $1.4 billion, export sales of $433 million. They also employed 3,020 employees in bioproduct activities across Canada and invested $59.5 million in R&D.**

  The sector is regionally dispersed with Ontario and Quebec home to 54% of firms, accounting for nearly two-thirds of bioproduct employees.

  Western Canada accounts for 38% of firms and 29% of total employment, while 8% of firms are located in the Atlantic region and make up 7% of total employment.

Chart B3.23
Number of Bioproduct Firms in Canada
by Region
2009

Source: Statistics Canada, Bioproducts Production and Development Survey, 2009.
Note: *Bioproduct employees are employees spending at least 50% of their time on bioproduct activities.

NOTE(S):

Bioproduct firms are firms which use renewable biomass to produce and/or develop non-conventional industrial bioproducts. These bioproducts often supply many different industries as intermediary inputs, usually designed to substitute for petroleum-based inputs. These firms can be found in several different industries. Many bioproduct firms also produce other products that are not considered bioproducts, such as co-products from the bioproducts production stream (e.g., distillers grains). As well, many firms are involved in other lines of business.

Canada's bioproduct firms are developing and producing a broad spectrum of industrial bioproducts

- **Bioproduct firms were involved in the development and production of fuels, energy, organic chemicals, bio-pesticides, bio-catalysts and bio-enzymes as well as other materials and composites.**

  In 2009, 29 firms were involved in ethanol (for fuel) production: ethanol generated 69% of total bioproduct revenues in 2009. Forty firms were involved in biodiesel (for fuel) production, 31 were involved in other organic chemicals and 13 firms were involved in lubricants and greases in 2009.

Chart B3.24
Bioproduct Activity Reported by Firms
2009

	FIRMS INVOLVED BY STAGE OF DEVELOPMENT			
	At Any Stage	Research and Development	Proof of Concept/ Product	Production/ On Market
Type of Bioproduct	Number of Firms			
LIQUID FUELS				
Ethanol	29	10	11	20
Biodiesel	40	23	21	29
Other Liquid Fuels	18	10	13	14
Gaseous Fuels	14	10	10	NA
Solid Fuels	16	7	11	NA
Bioenergy	42	27	29	21
ORGANIC CHEMICALS				
Lubricants and greases	13	9	NA	9
Polymers	16	12	10	10
Fine Chemicals	12	7	NA	NA
Solvents	6	NA	NA	NA
Other Organic Chemicals	31	16	17	20
BIO-PESTICIDES	**19**	**14**	**8**	**18**
BIO-CATALYSTS AND BIO-ENZYMES	**10**	**10**	**NA**	**10**
MATERIALS AND COMPOSITES				
Composites	12	NA	NA	8
Fibreboard/Agri-Fibre Panels	7	5	NA	NA
Materials	13	7	NA	9
OTHER BIOPRODUCTS	**57**	**23**	**26**	**43**

Source: Statistics Canada, Bioproducts Production and Development Survey, 2009.

Note: NA indicates data was not available due to the confidentiality requirements of the Statistics Act.
Totals cannot be added because firms can be engaged in multiple activities.

NOTE(S):

Bioproducts (output) are products (other than food, feed, and medicines) made from renewable biological inputs (often referred to as biomass feedstock). For the purpose of the 2009 Bioproducts Production and Development Survey, firms were asked to distinguish between "non-conventional industrial bioproducts" or "traditional bioproducts", such as wood products, since only non-conventional bioproducts or those produced using a novel process were included in the survey.

The emerging bioproducts sector makes use of agricultural and forestry biomass

- **In 2009, firms reported using over 27 million metric tonnes of biomass feedstock. The two major sources of biomass feedstock were forestry (16.4 million metric tonnes) and agriculture (10.6 million metric tonnes).**

  Of the 110 firms reporting using agricultural biomass, 87 firms indicated that this was their primary source of biomass. Similarly, 50 firms reported using forestry biomass, with 46 of those reporting forestry materials as their primary source of biomass.

Chart B3.25
Type of Biomass Used as Input, Canada
2009

	ESTIMATED QUANTITY	REPORT AS PRIMARY BIOMASS	REPORT USE
	(Metric Tonnes)	(Number of Firms)	
AGRICULTURAL BIOMASS	**10,555,073**	**87**	**110**
Wheat Grain (include seed equivalent of starch or flour)	614,580		
Corn Grain (include seed equivalent of starch or oil)	3,757,624		
FORESTRY BIOMASS (forestry products/slash, mill waste/residue)	**16,419,231**	**46**	**50**
Forest Residue	1,363,381		
Mill Processing Residues (e.g., black liquor, wood chips)	12,365,928		
Urban Wood Residues (e.g. construct./demol. debris, indust. wood waste, trees)	2,689,921		
MARINE AND AQUACULTURE MATERIALS/PRODUCTS (e.g. algae)	**NA**	**10**	**12**
FOOD PROCESSING, SLAUGHTER/RENDERED BY-PRODUCTS	**200,509**	**15**	**23**
FOOD SERVICE BY-PRODUCTS (e.g. recycled restaurant fats)	**NA**	**NA**	**12**
MUNICIPAL ORGANIC SOLID WASTE (e.g. yard waste)	**NA**	**NA**	**7**
OTHER BIOMASS	**224,720**	**39**	**49**

Source: Statistics Canada, Bioproducts Production and Development Survey, 2009.
Note: NA indicates data was not available due to the confidentiality requirements of the Statistics Act.

NOTE(S):

Biomass (input) refers to renewable biological materials, and includes: biological materials from forestry, agriculture, marine and aquaculture sources, or of a micro-biological origin; by-products from processing (e.g., agricultural/forestry/pulp & paper/food/feed processing); recycled bio-materials (e.g., construction/demolition materials); and waste materials (e.g., municipal solid wastes).

Canada's bioproducts sector is represented by a high proportion of recent entrants, as well as smaller firms

- **Most firms are small with a large share of their employees involved in bioproduct activities.**

  Small firms make up over 80% of firms in the sector, with the average firm size being 14 employees. Bioproducts employees make up 70% of these small firms' workforce. For medium-sized firms (averaging 58 employees), 55% of their workforce is involved in bioproduct activities. Large firms make up 12% of the total; with an average of 1,626 employees per firm. But these employees make up only 2% of the workforce within these large firms.

  Employees in small firms account for over half (54.1%) of the bioproduct sector's workforce, while those in large firms account for 31.5%. Employees in medium-sized firms account for only 14.7% of the total workforce.

Chart B3.26
Firm Size and Concentration of Bioproduct Activities, Canada
2009

FIRM SIZE	FIRMS		AVERAGE FIRM SIZE	EMPLOYEES WITH BIOPRODUCT RESPONSIB.	SHARE OF SECTOR'S BIOPRODUCT EMPLOYEES
Employees	Number	Percent	Employees	Percent	Percent
Small	169	81	14	70	54.1
Medium	14	7	58	55	14.7
Large	26	12	1,636	2	31.5

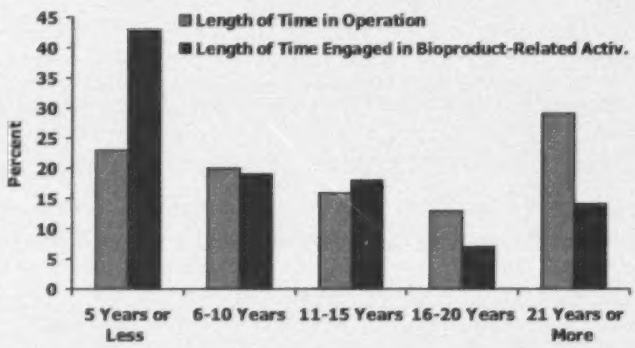
Source: Statistics Canada, Bioproducts Production and Development Survey, 2009.
Note: Small (less than 50 employees).
Medium (51-149 employees).
Large (more than 150 employees).

- **Firms involved in bioproduct-related activities in Canada tend to be recent entrants into the industry.**

  Although 28% of the firms reporting bioproduct-related activities have been operating in Canada for more than 20 years, one-third began operations after 2005.

  For many firms, bioproduct-related activities are even more recent with 43% of firms reporting they began their bioproduct activities after 2005, 62% entered into these activities after 2000. However, 14% of those firms currently involved in bioproduct activities have been involved in bioproduct-related activities for 21 years or more.

Chart B3.27
Share of Bioproduct Firms by Length of Time in Operation and Time Engaged in Bioproduct-Related Activities
2009



Source: Statistics Canada, Bioproducts Production and Development Survey, 2009.

The emerging bioproducts sector is research-intensive and employs a high proportion of skilled workers compared to other sectors

- **Research and development (R&D) spending accounted for 4% of bioproduct revenues in 2009.**

  R&D as a share of bioproduct revenue fell between 2008 and 2009. In 2008, R&D spending on bioproduct development comprised 6% of the revenues specifically derived from bioproducts. Compared with other industries such as food processing, this level of spending on R&D is relatively high.

Chart B3.28
Revenues and R&D Expenditures of Bioproduct Firms
2008-2009

	2008	2009
	Thousand $	
REVENUES FROM BIOPRODUCTS	1,152,282	1,434,142
BIOPRODUCT RESEARCH		
R&D Spending on Bioproduct Development (in-house)	49,934	50,152
R&D Spending on Bioproduct Development (contracted out)	13,497	9,438
R&D Spending on Biomass Development	14,540	14,428
R&D as a Share of Bioproduct Revenue	6%	4%

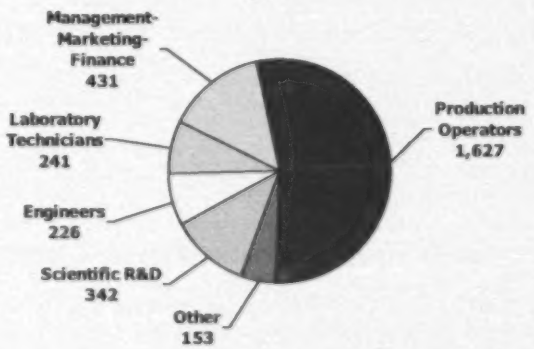
Source: Statistics Canada, Bioproducts Production and Development Survey, 2009.
Note: In current dollars.

- **Employees devoted to R&D accounted for more than 10% of the bioproducts industry's employment in 2009.**

  Although just over one-half of the more than 3,000 employees with bioproduct responsibilities were employed in production-related activities, a relatively large share was employed in science and technology.

  Close to one-third of reported employment was in the area of science, research, development or engineering. Together the 342 scientists and research managers, 241 lab technicians and 226 engineers accounted for about 27% of employment in bioproduct-related activities.

Chart B3.29
Number of Employees in the Bioproducts Industry by Type
2009



Source: Statistics Canada, Bioproducts Production and Development Survey, 2009.

This emerging sector faces various challenges to production and development

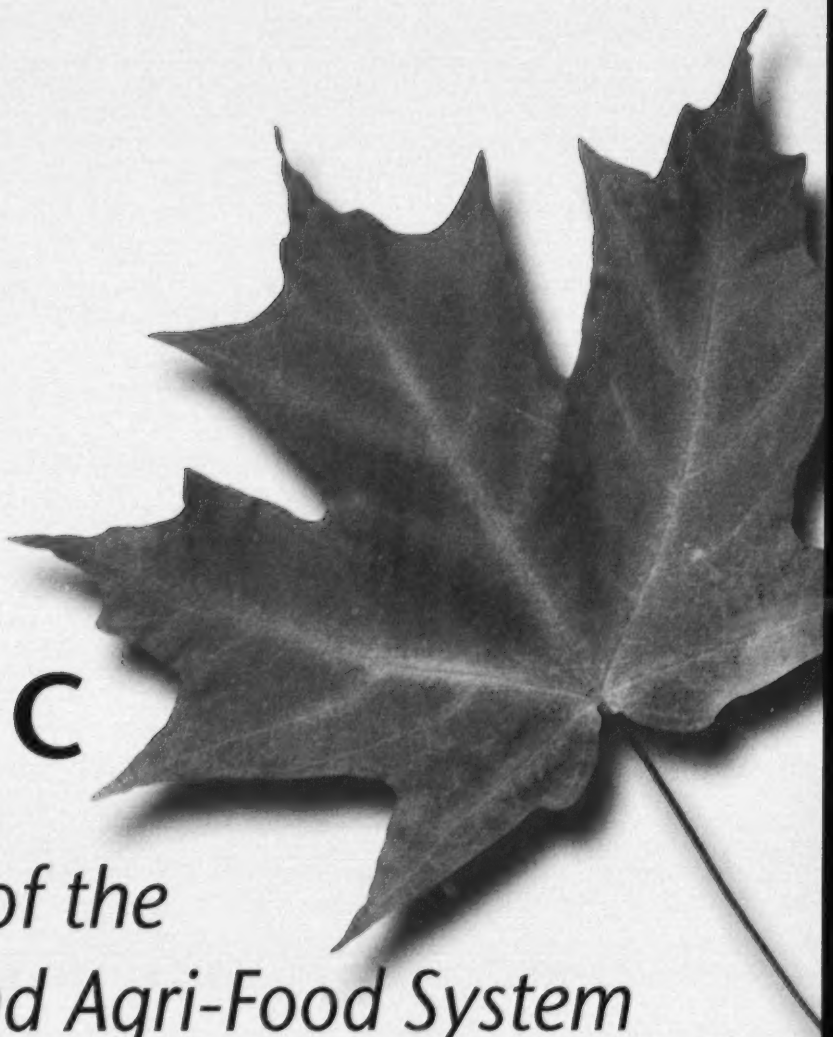
- **The top barriers reported by firms in this sector include the lack of financial capital and the cost and timeliness of regulatory approval.**

  More than one-half of bioproduct firms reported that the lack of financial capital was an important (high) barrier to production and development. The cost and timeliness of regulatory approval was also reported to be an important barrier by over one-half of bioproduct firms.

  Fewer than 20% of firms reported unreliable quality or quantity of biomass as important barriers to production or development. However, 42% rated the cost of biomass as an important barrier. Of medium importance was the lack of skilled human resources as reported by 10% of firms.

Chart B3.30
Perceived Barriers to Production or Development of Bioproducts
2009

Source: Statistics Canada, Bioproducts Production and Development Survey, 2009.



SECTION C

Components of the Agriculture and Agri-Food System

SECTION C1

Consumers

INTRODUCTION:

The year 2010 was characterized by an economic recovery, which followed the recession of 2008 and 2009. Per capita personal disposable income rose once again in 2010 as employment regained its pre-recession levels. However, household debt continued to climb but at an increasingly slower rate as consumers tightened their belts and cut back on discretionary spending.

Consumers resumed their spending on many durable items such as cars and appliances. As well, spending on food, particularly food from stores, continued to grow in 2010. Spending on meals away from home also resumed its growth after having declined during the recession. Retail food price inflation remained below the overall rate of inflation, which itself was weak in 2010.

Canadian consumers are increasingly looking beyond staple foods to products with attributes that reflect their divergent preferences and values such as local, environmentally-friendly, healthy, fair trade and animal friendly, among other things. The food industry is responding with a variety of products which reflect these consumer preferences.

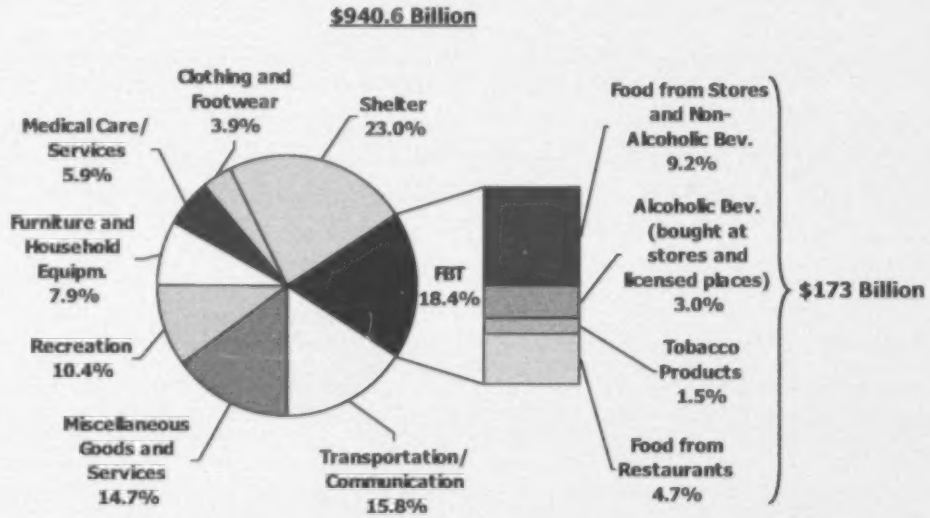
Canadian consumers spent about $173 billion on food, beverages and tobacco in 2010

- **In 2010, Canadians spent a total of $940.6 billion (current $) on goods and services, up from $898 billion in 2009.**

  Canadians spent the largest amounts on shelter and transportation and communications, at $216 billion and $148.4 billion, respectively in 2010. Other important expenditure items included recreation and miscellaneous goods and services. All major categories of personal spending were higher in 2010.

  Total spending on food, which includes food from stores and non-alcoholic beverages, food from restaurants, alcoholic beverages and tobacco, rose to $173 billion, to account for 18.4% of the total.

Chart C1.1
Distribution of Personal Expenditures on Goods and Services
2010



Source: Statistics Canada custom tabulation and AAFC calculations.

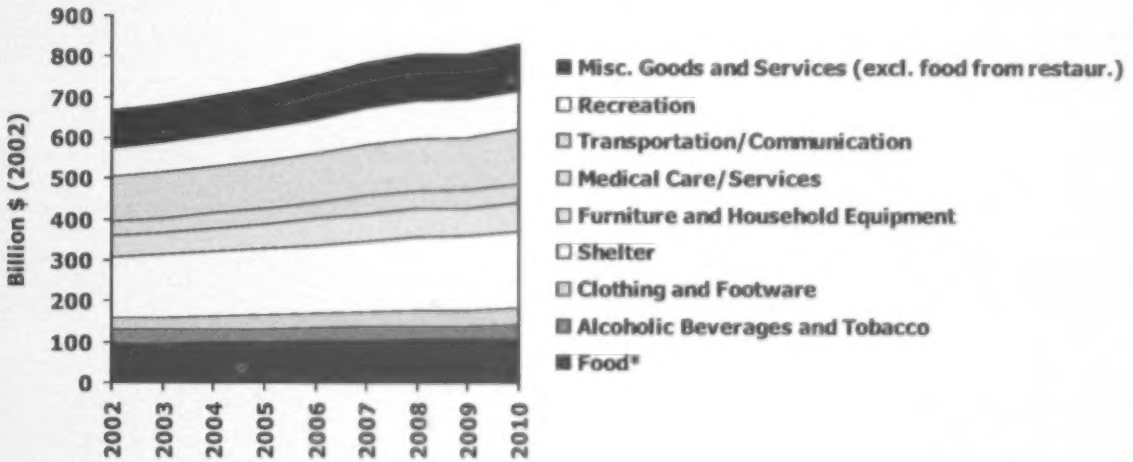
Note: 'Shelter' includes gross rent, fuel and power.
'Furniture and Household Equipment' includes furnishings and maintenance.
'Recreation' includes entertainment, educational and cultural services.

The Canadian economy recovered in 2010, and personal spending on major consumer goods and services rose moderately

- **Real personal expenditures on food, beverages and tobacco represented the third-largest consumer goods expenditure category after shelter, and miscellaneous goods and services.**

  In 2010, Canadians spent $106.8 billion (in real 2002 dollars) on food from stores and non-alcoholic beverages and food from restaurants, representing a 2% increase over 2009. Canadians increased their spending on alcoholic beverages and tobacco consumption by 1.1% in 2010. Total expenditures on food from restaurants rose by 2.4% to $35.9 billion, which is up from 2009.

Chart C1.2
Distribution of Real Personal Expenditures on Goods and Services
2002-2010



Source: Statistics Canada and AAFC calculations.

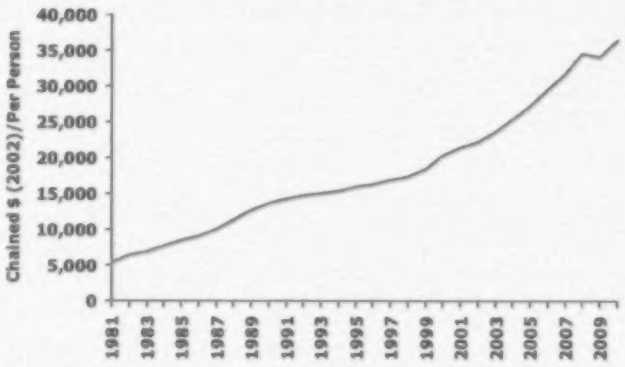
Note: *Food includes food from stores and non-alcoholic beverages and food from restaurants.

While real per capita personal disposable income resumed its trend upwards in 2010, concerns about heavy household debt have led more Canadian households to save more of their income to pay off this debt

- **Real per capita personal disposable income rose from $34,093 in 2009 to $36,439 in 2010.**

  The Canadian economy rebounded strongly from the recession of 2009, particularly in regard to personal income gains. Real per capita personal disposable income grew by about 7% (6.88%) between 2009 and 2010, resuming its long-term upward trend.

Chart C1.3
Real Per Capita Disposable Income
1981-2010

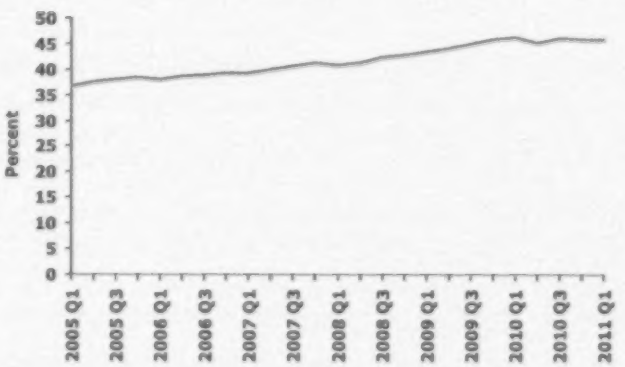


Source: Statistics Canada and AAFC calculations.

- **At the same time as income rose, growth in consumer credit, which is the non-mortgage component of consumer debt, slowed to its slowest pace since the early 1990s.**

  Growth in Canadian household credit has now slowed to its slowest year-over-year pace since 2002. Growth in non-mortgage consumer credit will enter negative territory in the second half of 2011 at this rate of slowing. As consumers rid themselves of their debt burden, they will position themselves for greater financial health and hence higher spending in the future.

Chart C1.4
Consumer Credit as a Percent of Personal Disposable Income
2005-2011



Source: CIBC World Markets Household Credit Analysis July 2011.
Note: Q1 = first quarter, Q2 = second quarter, Q3 = third quarter and Q4 = fourth quarter.

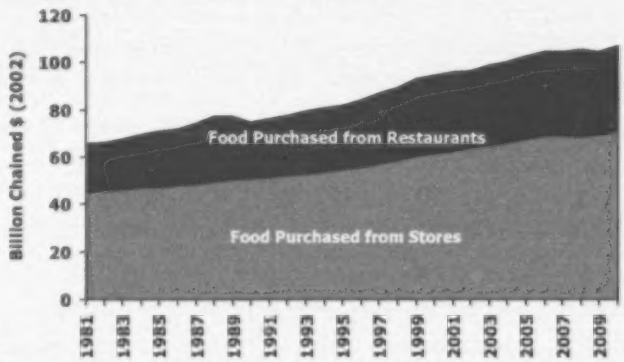
Canadian consumers continue to spend more on food from stores and from restaurants in per capita and absolute terms

- **Real personal expenditures on food (i.e., food and non-alcoholic beverages from stores and food from restaurants) increased slightly in 2010.**

  Total real personal spending on food from stores rose from $69.49 billion in 2009 to $70.9 billion in 2010, while spending on food purchased from restaurants increased slightly from $35.1 billion to $35.9 billion, for a total increase of 2.1% between 2009 and 2010.

  Approximately 34% of total food expenditures was spent on food purchased from restaurants, while 66% was spent on food purchased from stores. This is roughly the same allocation of consumers' food budgets that were allocated to each food category in 2009.

Chart C1.5
Real Personal Expenditures on Food
1981-2010



Source: Statistics Canada and AAFC calculations.
Note: Does not include expenditures on alcoholic beverages and tobacco.

- **On a per capita basis, real spending on food rose slightly to $3,133 in 2010 from $3,100 in 2009, as both spending on food from stores and from restaurants increased.**

  Real per capita spending on food has increased over time from $2,636 in 1981 to $3,133 in 2010. At the same time, the share of consumers' budgets allocated to both from stores and from restaurants has fallen from 17.4% in 1981 to 12.7% in 2009.

Chart C1.6
Real Per Capita Expenditures on Food Purchased from Stores and from Restaurants
1981-2010

YEAR	TOTAL FOOD EXPENDITURES	POPULATION	PER CAPITA FOOD EXPENDIT.	TOTAL FOOD EXP. AS % OF TOTAL PERSONAL SPENDING
	Billion Chained $ (2002)	Number of People	Chained $ (2002)	Percent
1981	65.4	24,819,915	2,636	17.4
1991	76.6	28,037,420	2,689	15.8
2001	94.7	31,019,020	3,054	15.0
2008	104.9	33,327,337	3,147	12.9
2009	104.6	33,739,859	3,100	12.8
2010	106.8	34,108,752	3,133	12.7

Source: Statistics Canada and AAFC calculations.
Note: Total food expenditures includes spending on Food Purchased from Stores (food and non-alcoholic beverages) and on Food Purchased from Restaurants.

Higher income Canadians allocated a smaller share of their income to food than did lower income Canadians and Americans

- **In 2009, higher income households spent a declining share of their total budgets on food from stores.**

  In 2009, the lowest income quintile (the first quintile) spent 84.6% of their food budget on food from stores and only 15.3% on food from restaurants. As income rose, higher income classes allocated a greater share of their food budget to food from restaurants, rising to 25% of their total food budget in the highest income class (the fifth quintile).

Chart C1.7
Share of Household Expenditures on Food Purchased from Stores and from Restaurants by Income Quintile* 2009

Source: Statistics Canada, custom tabulation.

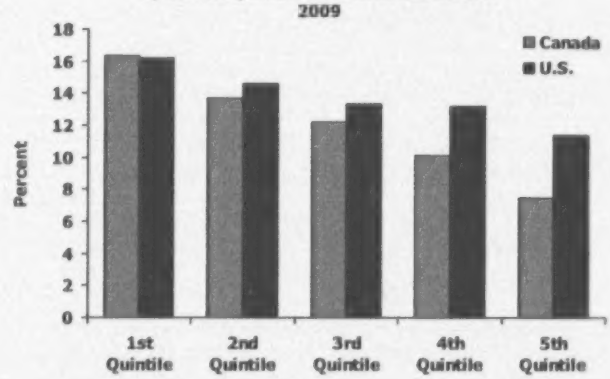
Note: * Quintile: Households are ranked in ascending order by total household income and are divided into five equal groups. The 1st quintile is the lowest 20% of households and the 5th quintile is the highest 20% of households.

- **Canadian households in the highest income class (the fifth quintile) tend to allocate a smaller share of their household expenditures to food than do their American counterparts.**

  In 2009, the top 20% of Canadian households with the highest income (5th quintile) allocated only 7.5% of their household budgets to food, compared to 11.4% for households in the same income class in the U.S.

  For households in the lower income classes, the budget share allocated to food was more comparable between Canada and the U.S., with the lowest income class (the first quintile) spending an almost identical share on food at 16.3% and 16.2%, respectively.

Chart C1.8
Share of Household Expenditures Spent on Food by Income Quintile* in Canada and the U.S. 2009



Source: Statistics Canada, U.S. Bureau of Labor Statistics and AAFC calculations.

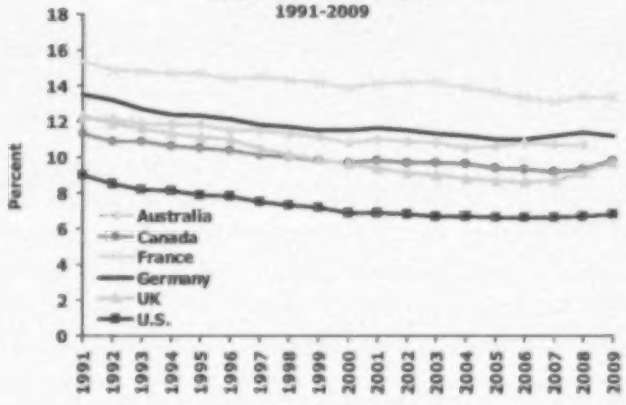
Note: * Quintile: Households are ranked in ascending order by total household income and are divided into five equal groups. The 1st quintile is the lowest 20% of households and the 5th quintile is the highest 20% of households.

Canadian households are typical of those in developed economies, where the share of their household budgets allocated to food and non-alcoholic beverages has been declining over time

- **Overall, the share of total household expenditures on food and non-alcoholic beverages has been declining in all major OECD countries over time.**

  However, by 2009, Canadians allocated a smaller proportion of their expenditures on food and non-alcoholic beverages compared to several other OECD countries. In 2009, Canadian households allocated about 9.8% of their personal disposable income on food and non-alcoholic beverages, up slightly from 9.3% in 2008. In 2009, Canada's share was comparable to the UK (9.7%), but substantially lower than France (13.4%) and Germany (11.2%). Consumers in the U.S. allocated the lowest share to food and non-alcoholic beverages at 6.8%. This compares to 1991, when Canadian households allocated almost 11.3% of their budgets to food.

Chart C1.9
Share of Household Expenditures
Spent on Food and Non-Alcoholic Beverages
in Selected OECD Countries
1991-2009



Source: OECD.

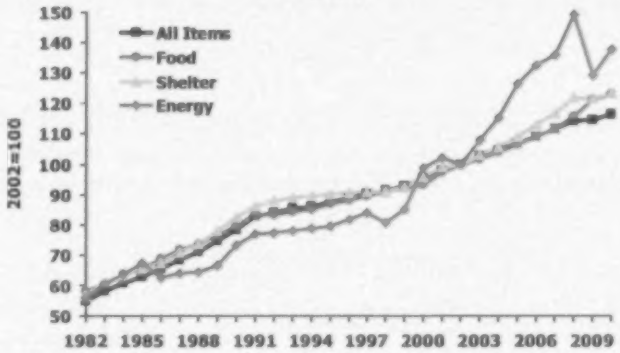
Retail food price inflation in Canada fell below the overall rate of inflation in 2010

- **Food price inflation has generally kept pace with overall consumer price inflation over the past several decades.**

  However, in 2010, food prices rose at an annual average rate of 1.4%, which was less than the 1.8% growth rate reported for overall consumer prices.

  Food price inflation has generally been far less volatile than energy prices faced by consumers, especially in the last few years. Again in 2010, as energy prices rose sharply, food prices increased moderately in line with other prices, such as those for shelter.

Chart C1.10
Consumer Price Indices (CPI)
for Food, Shelter, Energy and All Items
1982-2010



Source: Statistics Canada.

- **In 2010, retail food prices rose by 1.4% over the previous year. This was below the 4.9% food price inflation seen in 2009.**

  Sugar and confectionery was the only category to post strong price growth (8.1%) in 2010 due to higher world prices.

  Price growth in bakery and cereal products and dairy products slowed considerably in 2010 compared to 2009, while retail prices for beef, pork, fresh fruits and vegetables declined.

Chart C1.11
Canadian Retail Food Price Inflation by Category
2009 and 2010

CATEGORY	INFLATION (%)	
	2009	2010
Overall CPI	**0.3**	**1.8**
Food	**4.9**	**1.4**
Food Purchased From Stores	**5.5**	**1.0**
Beef Fresh or Frozen	5.8	-0.1
Pork Fresh or Frozen	3.6	-0.1
Poultry Fresh or Frozen	4.2	0.2
Dairy Products	3.6	0.9
Eggs	1.7	2.0
Bakery and Cereal Products	4.2	0.6
Fresh Fruit	6.3	-3.1
Fresh Vegetables	9.6	-2.6
Sugar and Confectionery	7.4	8.1
Fats and Oils	8.4	0.1
Food Purchased From Restaurants	**3.5**	**2.4**

Source: Statistics Canada and AAFC calculations.

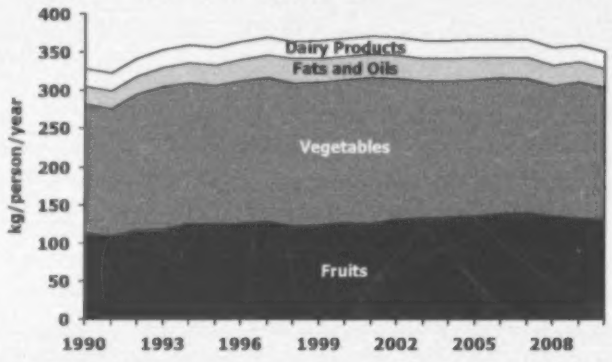
Canadian food preferences continue to change as reflected in trends in the consumption of fresh vegetables, yogurts, cheeses, cream and fats and oils and meats

- **In 2010, apparent per capita disappearance (or consumption) of fruits, vegetables, fats and oils and dairy products declined.**

  Apparent per capita disappearance is used to reflect the availability and hence the consumption of various food products. The reduction in the apparent per capita disappearance of fats and oils (6.0%) was substantial and led to lower consumption for possible health reasons. The decline in apparent consumption of vegetables was also substantial (3.5%) after the noticeable increase in 2009. Consumption of dairy products was also down by 1.5% in 2010.

  In the dairy category, Canadians significantly increased their per capita consumption of cream (56.4%) and cheese (13.0%), but lowered their consumption of fluid milk (18.3%) between 1990 and 2010.

Chart C1.12
Per Capita Consumption of Dairy Products, Fruits and Vegetables and Fats and Oils
1990-2010



Source: Statistics Canada and AAFC calculations.

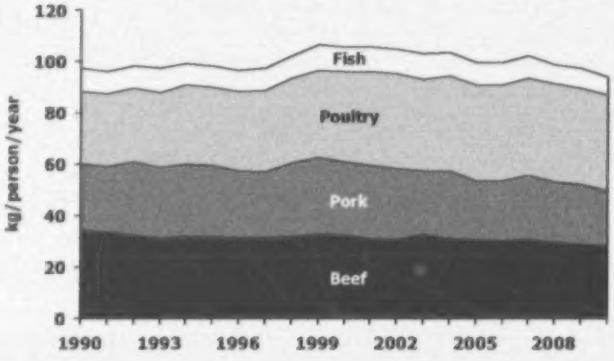
Note: Does not allow for losses, such as waste and/or spoilage in stores, households, private institutions or restaurants or losses during preparation. Represents food available for consumption and not actual quantities of food consumed.

- **In 2010, beef, pork, and poultry and fish consumption decreased from the previous year.**

  Beef consumption, which has been on a relatively steady trend downward since the mid-1970s, reached 27.69 kg per person in 2010, a 3.18% reduction from the previous year. Pork consumption has also been trending downward since 2000 and reached 21.69 kg per person in 2010, a large decline (7.15%) over the previous year. Poultry consumption also fell in 2010 from 37.66 to 37.4 kg/person.

  Fish consumption reached 7.33 kg per person in 2010, a 6.15% decline from the previous year.

Chart C1.13
Per Capita Consumption of Beef, Pork, Poultry and Fish
1990-2010



Source: Statistics Canada and AAFC calculations.

Note: 1) Does not allow for losses, such as waste and/or spoilage in stores, households, private institutions or restaurants or losses during preparation. Represents food available for consumption and not actual quantities of food consumed.

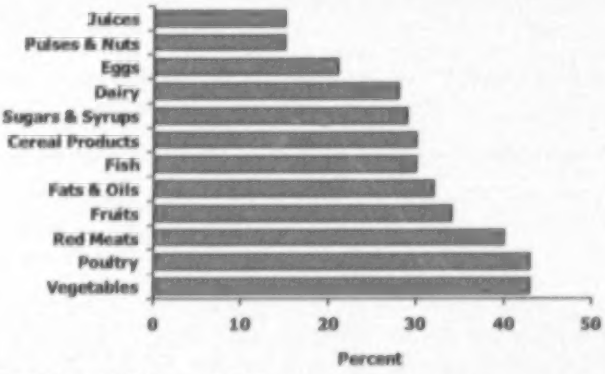
2) Fish includes fresh and frozen sea fish, freshwater fish, processed sea fish and shellfish.

Increasingly, the amount of food that is wasted is being considered in efforts to ensure there will be ample food available in the future to feed the world's population

- **Estimates of food waste in Canada range from 15% to almost 45% of food available for consumption, depending on the commodity.**

  Estimates have been derived from apparent per capita consumption information and are shown to differ by commodity group. For example, more vegetables and poultry are lost as food waste than for other commodity groups in Canada, (44% and 43% of food available, respectively), whereas only 15% of juices and 20% of eggs are wasted. Most of this waste occurs at the household level in preparation and storage.

Chart C1.14
Food Waste in the Canadian Food Supply
by Category
2009



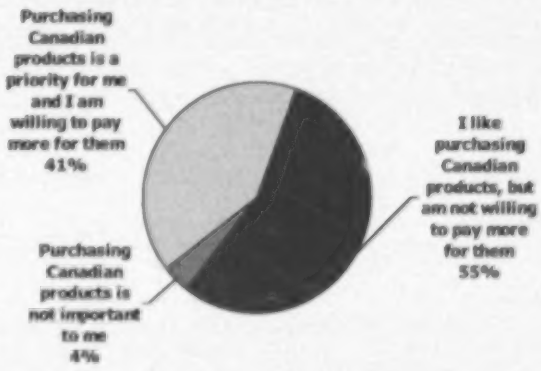
Source: Statistics Canada and AAFC calculations.

In addition to price, which is the most important factor, Canadian consumers base their food choices on a variety of other issues including whether their food is Canadian, locally grown, organic or safe

- **According to a 2011 survey by Farm Credit Canada (FCC), 96% of Canadian consumers claimed that buying Canadian products is important to them.**

  Fifty-five percent of consumers said they liked purchasing Canadian products but would not be willing to pay more for them. On the other hand, 41% of consumers said that Canadian products are a priority and that they would be willing to pay more for them. Only 4% reported that purchasing Canadian products was not important to them.

Chart C1.15
Consumer Preferences for Purchasing Canadian Products
2011

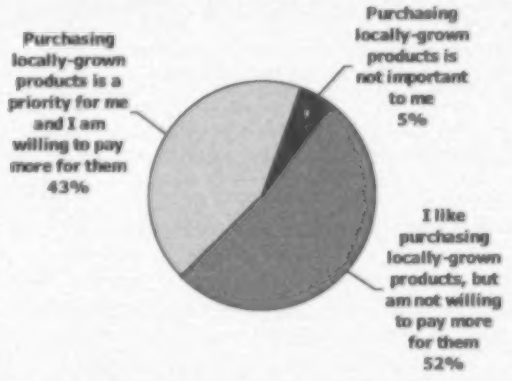

Purchasing Canadian products is a priority for me and I am willing to pay more for them 41%
I like purchasing Canadian products, but am not willing to pay more for them 55%
Purchasing Canadian products is not important to me 4%

Source: FCC Vision Research, Canadian Consumer Food Purchase Intentions, 2011.

- **Locally-grown food products are also becoming more important for Canadian consumers.**

  According to the same poll, 43% of Canadians reported that purchasing locally-grown products is a priority for them and that they would be willing to pay more for them. Fifty-two percent of consumers reported they liked purchasing locally-grown products but would be unwilling to pay more for them. A mere 5% of consumers reported that locally-grown products were not important to them. The majority of consumers who were willing to pay more for locally-grown products were older (aged 55+) and wealthier (with an income of $100,000 or more).

Chart C1.16
Consumer Preferences for Purchasing Locally-Grown Food
2011


Purchasing locally-grown products is a priority for me and I am willing to pay more for them 43%
Purchasing locally-grown products is not important to me 5%
I like purchasing locally-grown products, but am not willing to pay more for them 52%

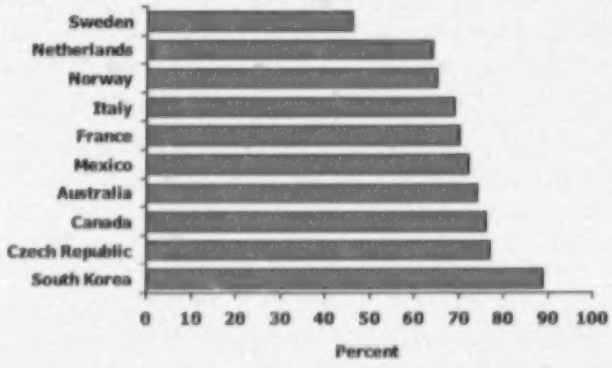
Source: FCC Vision Research, Canadian Consumer Food Purchase Intentions, 2011.

Canadian households have many reasons for purchasing organic food, with health identified as the most important

- **A survey of over 10,000 households in ten OECD countries showed that 76% of Canadian respondents ranked health higher than the environment as the motivation for consuming organic food.**

  Households in Canada, Korea and the Czech Republic ranked health higher than the environment as a motivating factor behind consuming organic food. The results also showed that high prices for organic food relative to conventional food, as well as social considerations (e.g. protection of the environment or animal welfare) and trust in labelling and certification influenced consumers' decisions to purchase organic food.

Chart C1.17
Proportion of Households Ranking Health Higher than the Environment as Motivation to Consume Organic Food, Selected OECD Countries
2010

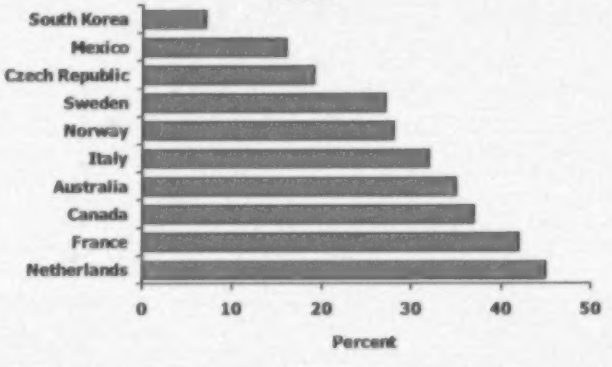


Source: OECD Report, Greening Household Behaviour: The Role of Public Policy, 2011.

- **The survey also indicated that consumers were generally not willing to pay more than a 15% price premium for organic products relative to conventional food products, regardless of the commodity. In particular, 37% of Canadian respondents claimed they were not willing to pay any price premium for organic food.**

  Canada had the third-highest proportion of respondents (37%) who were not willing to pay a premium for organic food. The average among OECD countries was 29%. Specifically, consumers who do not trust existing certification systems are not willing to pay more for organic food compared to conventional products. The survey results showed that those concerned with the environment and those perceiving significant health benefits from organic food were willing to pay a higher premium.

Chart C1.18
Percent of Consumers Unwilling to Pay a Premium for Organic Food, Selected OECD Countries
2010



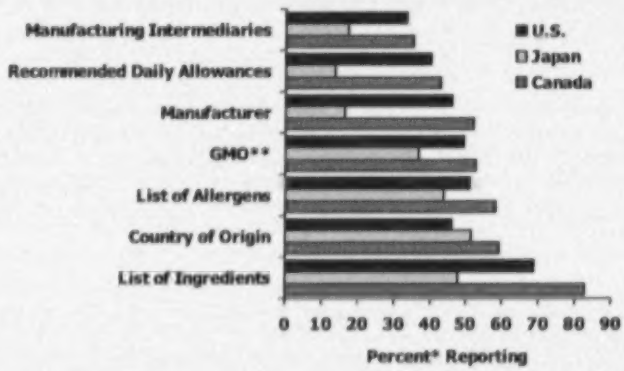
Source: OECD Report, Greening Household Behaviour: The Role of Public Policy, 2011.

Consumers look to food labels to receive important information about food products

- **When consumers were asked to rate the important information on food labels, the list of ingredients that make up a product was most important to Canadian and U.S. consumers, while Japanese consumers ranked this information second in importance.**

  In Japan, labels about the country of origin were most important, whereas Canadians ranked this second and Americans ranked it fourth. Consumers in all three countries reported that the list of allergens was also very important on labels.

Chart C1.19
Importance of Food Label Information for Canadian, U.S. and Japanese Consumers 2009 and 2010



Source: University of Alberta calculations, Leger Marketing and TNS Global Market Research Data, 2009 and 2010.

Note: * Net favourable percentage methodology by Rosellus, 1971 used.
** GMO: Genetically Modified Organism.

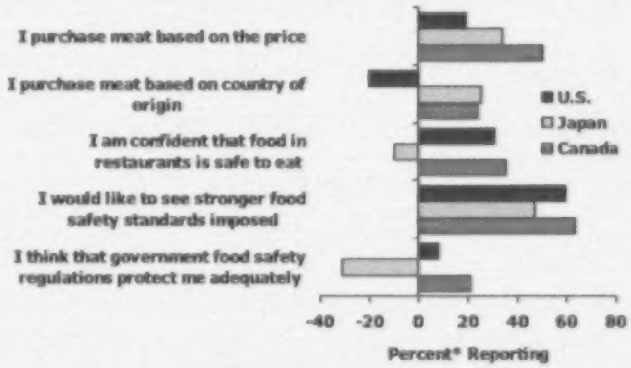
Stronger food safety standards were also very important to consumers in Canada, Japan and the U.S.

- **In 2009 and 2010, a majority of Canadian, U.S. and Japanese consumers reported that they would like to see stronger food safety standards imposed in their respective countries. Over 60% of consumers in Canada and the U.S. and over 40% in Japan reported a preference for stronger food safety standards.**

  More Canadian and U.S. consumers reported having confidence in the safety of food in restaurants, while Japanese consumers did not. Japanese consumers rated their government's food safety regulations to protect them adequately as very poor, whereas Canadian consumers rated their government relatively highly for these regulations, more than did U.S. consumers.

  U.S. consumers did not report basing their meat purchasing decisions on country of origin considerations, whereas Canadian and Japanese consumers did so. Furthermore, compared to U.S. consumers, a greater percentage of Japanese and Canadian consumers based their meat-purchase decisions on price.

Chart C1.20
Canadian, U.S. and Japanese Consumers' Ratings on Various Food Issues 2009 and 2010



Source: University of Alberta calculations, Leger Marketing and TNS Global Market Research Data, 2009 and 2010.

Note: *Net favourable percentage methodology by Roselius, 1971 used.

SECTION C2

Food Distribution (Retail/Wholesale and Foodservice)

INTRODUCTION:

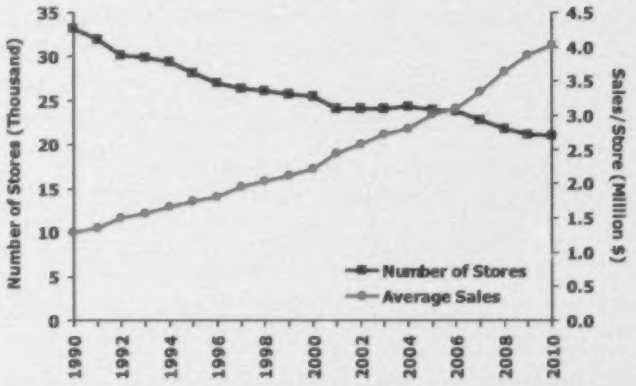
The food retail/wholesale and foodservice industries are major components of Canada's agriculture and agri-food system. Food retailers are on the front lines, responding to changing consumer demands, a changing marketplace and changing players (e.g., Walmart). They achieved these by restructuring to maintain or increase their market share, while forming alliances and networks with upstream suppliers in the supply chains in order to assure the safety, quality and other characteristics of food products they sell. Foodservice establishments also continue to adjust product and service offerings to increase sales in response to a fiercely competitive restaurant sector. They also face competition from food retailers who are offering consumers convenience with an increasing variety of prepared foods and take-home meals.

Food retailing continues to consolidate

- **Significant store rationalization has occurred during the past decade, with a move to larger operations.**

  Traditional supermarket chains have consolidated as they have faced increasing competition. In 2010, the total number of food stores continued to decline, down by 233 stores, to 21,009. The three-largest food retailers in Canada are Loblaw Cos. Ltd. ($31 billion in sales) with 1,027 stores across the country, Sobeys Inc. ($15.5 billion) with 1,334 stores, and Metro Inc. ($11.3 billion) with 566 stores in Ontario and Quebec.

Chart C2.1
Number of Canadian Food Stores and Average Sales
1990-2010

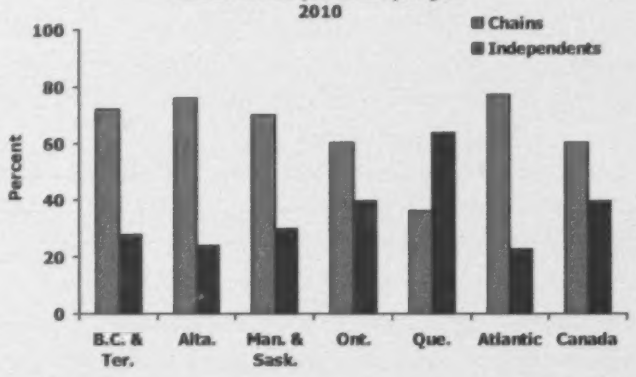


Source: Canadian Grocer, Statistics Canada and AAFC calculations.
Note: 2010 figures are estimates.

- **Supermarket chains dominate food store sales in all provinces except Quebec.**

  There are only two pan-Canadian grocery store chains in Canada, Loblaw Cos. Ltd. and Sobeys Inc. Overall, 60% of retail food sales are made in grocery store chains in Canada. However, the relative importance of chains as measured by the percentage of sales varies greatly by province. Chains are most important in the Atlantic Provinces (77.2%) and Alberta (76.1%) but much less important in Quebec (36.2%). In 2010, chains saw a slight increase in their share in eastern Canada, Alberta and British Columbia.

Chart C2.2
Share of Canadian Food Store Sales
Chains vs. Independents by Region
2010



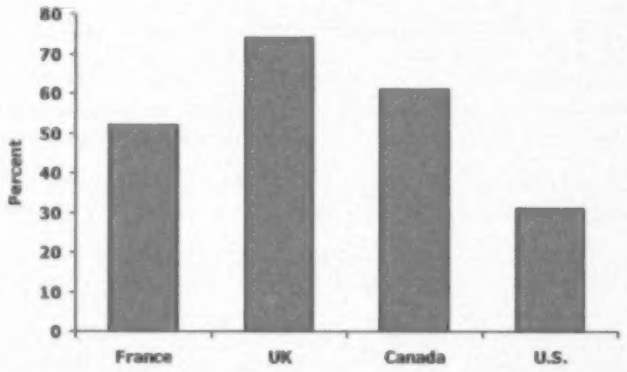
Source: Canadian Grocer, February 2011.

Food retail concentration in Canada, as measured by the market share of the top four Canadian food retailers, is higher than in the U.S. but lower than in the UK

- **The four-largest food retailers in Canada accounted for about 61% of national grocery sales.**

  The UK had higher levels of retail food store concentration than Canada at 75% of sales, while the U.S. and France had lower levels overall. However, on a regional basis, food retail concentration in the U.S. is high.

Chart C2.3
Market Share of Top Four Retailers in Selected Countries
2009



Source: TNS (UK), AC Nielsen (Canada), L'expansion.com (France), U.S. Census Bureau (U.S.) from CIBC World Markets Retail Conference Presentation, March 2009.

- **Profit margins of Canadian food and beverage retailers remained below those of all retailers in 2010, although the gap has narrowed.**

  Up until 2004, profit margins of all retailers were below those of food and beverage retailers, but have since risen above them. This reflects in part the increase in competition from non-food retailers such as Walmart, drug stores and others. The average profit margin for food and beverage retailers in 2010 was 3.1%, the highest rate since 2004.

Chart C2.4
Average Profit Margin Ratio*
for Food and Beverage Retailers
1999-2010

Source: Statistics Canada, Quarterly Financial Statistics for Enterprises.

Note: *See Glossary for definition of the profit margin ratio and non-financial industries. Does not include government-controlled co-operatives, for example LCBO, SAQ.

Food, soft drinks and other non-alcoholic beverages are increasingly sold in non-traditional retail outlets

- **General merchandise stores, gas stations and drug stores are increasingly selling food items, while traditional food and beverage stores (supermarkets) have expanded their non-food sections.**

  In 2010, sales of food and beverages in general merchandise stores accounted for 11.4% of the total food and beverage sales market, up from 7.6% in 1999 while the share sold in supermarkets fell from 88% to 84% over the period.

  Food and beverage sales in general merchandise stores grew at an average annual rate of 10% during the past 5 years, well above the 4% average growth rate experienced in supermarkets.

Chart C2.5
Food and Beverage Sales by Retail Channel
1999 vs. 2010

RETAIL CHANNEL	1999	2010
	PERCENT	
Food and Beverage Stores (Supermarkets)	87.8	84.0
General Merchandise Stores	7.6	11.4
Gas Stations and Automotive Dealers	2.5	2.7
Drug Stores	1.7	1.7
Other	0.4	0.2

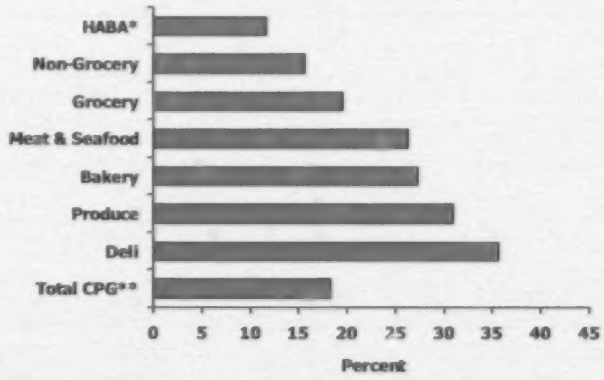
Source: Statistics Canada, Quarterly Retail Commodity Survey.

- **In 2010, private label products continued to account for a significant share (19.5%) of total grocery sales in Canada. During the recent recession, growth in private label product sales were flat in Canada while in the U.S., they increased in importance.**

  Private label brands accounted for a higher share of sales in the deli, produce and bakery departments of grocery stores at 35.6%, 31% and 27.3%, respectively. Private label brands grew (4%) more than name brand products (-2%) in the produce department.

  Development of private label products remains a key competitive strategy for large retailers to attract and retain customers. In 2010, Loblaw Cos. Ltd. launched over 1,200 new private label products and redesigned the packaging of approximately 300 products. Loblaw sales of private label products were valued at $8.2 billion, accounting for 26% of total sales. The main private label brands for Loblaw are "President's Choice" and "No-Name" which, according to the Nielsen Company, are the two largest consumer packaged goods brands in Canada, based on sales. The other major grocery store chains also continued to add private label products in their stores.

Chart C2.6
Private Label Share of Grocery Sales by Department
2010



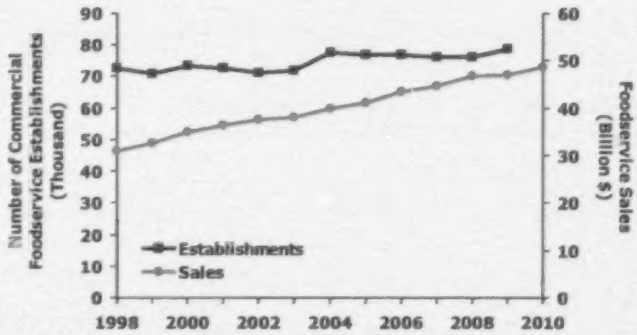
Source: Nielsen MarketTrack, National All Channels, 52 weeks to July 3, 2010.
Note: Excludes random weight fresh.
* Health and Beauty Aids (HABA).
** Consumer Packaged Goods (CPG).

Foodservice and restaurant sales continue to grow while bankruptcies remain historically low

- **Commercial foodservice (restaurants, etc.) sales have increased by 39% over the last decade, while the number of establishments has stabilized, growing on average by 1% per year.**

  Commercial foodservice sales were valued at $48.6 billion in 2010, representing a 3.2% increase over 2009. In 2009, there were around 78,600 commercial foodservice establishments in Canada; 6% in the Atlantic Provinces, 23% in Quebec, 40% in Ontario, 16% in the Prairies and 15% in British Columbia. In 2009, commercial foodservice sales fell slightly as a result of the economic recession in Canada.

Chart C2.7
Commercial Foodservice Sales and Number of Establishments
1998-2010



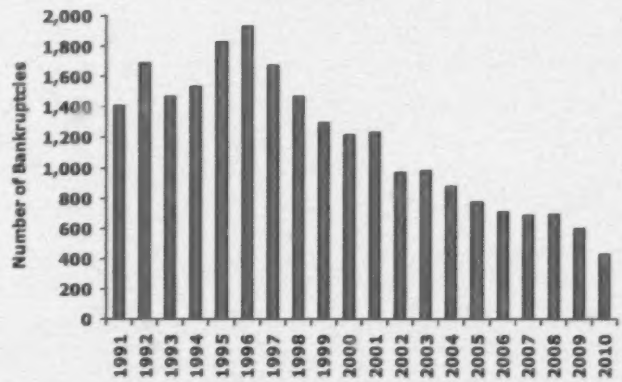
Source: Statistics Canada.
Note: Number of establishments data was discontinued and therefore not updated to 2010.

- **Commercial restaurant bankruptcies fell by 28% in 2010 compared to the previous year.**

  The number of bankruptcies declined considerably and fairly consistently over the last decade or so, from a high of 1,933 per year in 1996 to 426 in 2010, as an increasing share of restaurants are accounted for by major chains.

  Full-service restaurants, which account for 45% of total commercial foodservice establishments, also accounted for 7 out of 10 commercial foodservice bankruptcies in Canada in 2010. This is primarily due to their higher labour costs, lower profit margins and fierce competition in this sector.

Chart C2.8
Commercial Restaurant Bankruptcies
1991-2010



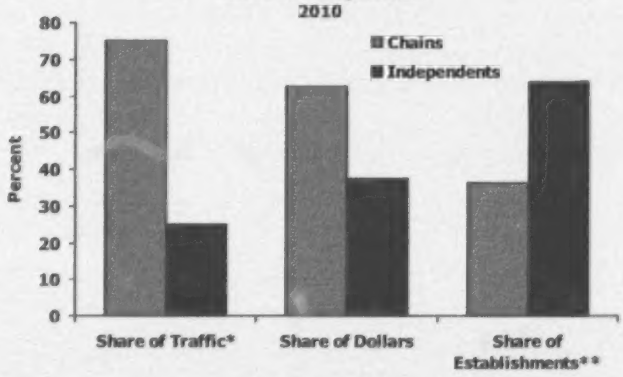
Source: Canadian Restaurant and Foodservices Association, Quarterly InfoStats.

Independent restaurants outnumber chain restaurants, but account for a smaller share of total sales and customer traffic

- **There are about twice as many independent restaurants as there are chain restaurants in Canada. However, independent restaurants account for only 38% of total sales and 25% of customer traffic.**

  In 2010, traffic at chain restaurants grew by 2.1%, while traffic at independent restaurants declined by 3.6%. In 2009, the top 50 foodservice companies (chains) accounted for 51% of industry sales and about 30% of establishments.

Chart C2.9
Foodservice Market Share
Chains vs. Independents
2010



Source: Canadian Restaurant and Foodservices Association.

Note: * Customer traffic refers to the number of customers visiting these restaurants per year.
** Data refers to chain and independent foodservice sourced from restaurants and retail stores.

Canadians spent more on restaurant meals compared to last year

- **For the first time in over a decade, sales at limited-service restaurants surpassed sales at full-service restaurants. On the heel of the recession, consumers' desire for value limited sales growth at full-service restaurants.**

  In 2010, overall foodservice sales rebounded by 3.3% following a decline in 2009 when the economic recession negatively affected most foodservice channels. Total foodservice sales (i.e., commercial and non-commercial foodservice) were estimated at $60.9 billion in 2010. The foodservice channels which experienced the most robust growth were contract and social caterers (7.1%), accommodation foodservice (5.5%) as well as limited-service restaurants (5.4%). Drinking places and retail foodservice experienced declines of 3.4% and 3.6%, respectively.

Chart C2.10
Sales and Market Share by Foodservice Category
2010

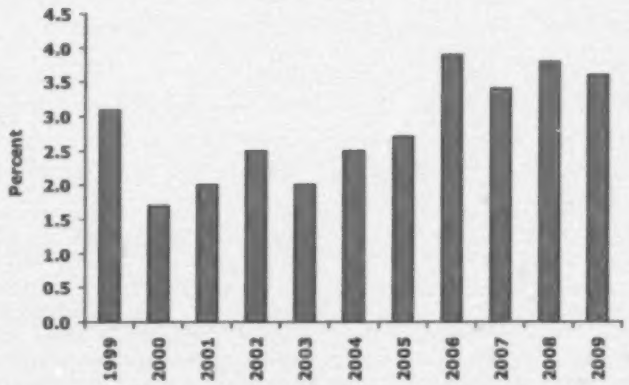
2010	(MILLION $)	PERCENT
Commercial Foodservice	**48,617**	**80**
Limited-Service Restaurants	21,220	35
Full-Service Restaurants	20,931	34
Contract and Social Caterers	3,998	7
Pubs, Taverns and Nightclubs	2,468	4
Total Non-Commercial Foodservice*	**12,255**	**20**
Accommodation Foodservice	5,128	8
Institutional Foodservice	3,636	6
Retail Foodservice	1,236	2
Other Foodservice**	2,255	4
Total Foodservice	**60,872**	**100**

Source: Statistics Canada, Canadian Restaurant and Foodservices Association and AAFC calculations.
Note: * Non-Commercial figures are preliminary.
** Includes vending, sports/private clubs, theatres, stadiums and other seasonal/entertainment operations.

- **In 2009, profit margins declined slightly for foodservice and drinking places.**

  Foodservice and drinking places saw a slight decline in average profit margins, down from 3.8% in 2008 to 3.6% in 2009, as a result of the recession. Prior to reaching their peak in 2006, profit margins for foodservice and drinking places had been growing steadily throughout most of the decade, from a low of 1.7% in 2000 to a peak of 3.9% in 2006.

Chart C2.11
Profit Margins for Foodservice and Drinking Places
1999-2009



Source: Statistics Canada, Financial and Taxation Statistics for Enterprises, Annual.

NOTE(S):

The foodservice and drinking places subsector, according to Statistics Canada, comprises establishments primarily engaged in preparing meals, snacks and beverages to customer order for immediate consumption on and off the premises. This subsector does not include foodservice activities that occur within establishments such as hotels, civic and social associations, amusement and recreation parks, and theatres. However, leased foodservice locations in facilities such as hotels, shopping malls, airports and departments stores are included. The industry groups within this subsector reflect the level and type of service provided.

Institutional foodservice is another major component of the foodservice sector

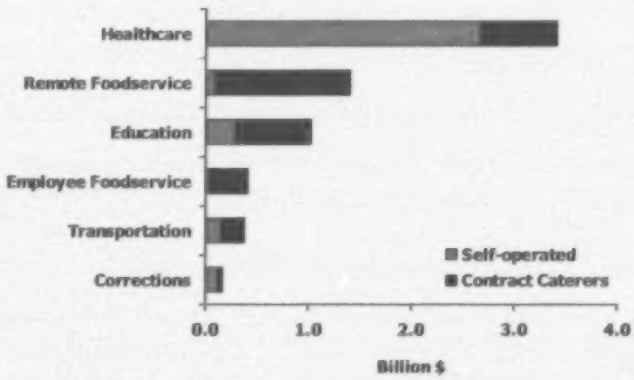
- **The institutional foodservice market was estimated at $6.6 billion in 2010, accounting for approximately 11% of the total foodservice sector.**

  Revenues from institutional foodservice by contract caterers accounted for $3 billion (or 45% of the institutional market) and are included in the figure reported under contract and social caterers in the commercial foodservice segment. Institutional foodservice that is self-operated, accounted for $3.6 billion (or 55%), and is reported under institutional foodservice in the non-commercial foodservice segment.

  Healthcare institutions account for 52% of the institutional foodservice sector, and are largely self-operated (78%). Other institutional sectors such as remote foodservice and employee foodservice are more dependent on contract caterers (about 90%).

  Significant providers of institutional services include Compass Group Canada, Aramark Canada and Sodexo, Inc.

Chart C2.12
Institutional Foodservice Market
2010



Source: fsSTRATEGY Inc., 2011 Canadian Institutional Foodservice Market Report.

Note: Other subsectors for which data is not consistently available are not included (e.g., Military and Coast Guard).

NOTE(S):

The institutional foodservice market includes: healthcare (e.g., hospitals, long-term care facilities, and retirement homes), education (e.g., private schools, high schools, colleges and universities), transportation (e.g., airlines, trains, ferries, and cruise lines), corrections (provincial and federal correctional facilities), remote foodservice (e.g., remote camps servicing mining, forestry, oil and gas, fire fighting, hydro, road construction and rail maintenance) and employee foodservices (e.g., foodservice for private/public sector employees in offices and establishments). Other institutional foodservice markets (e.g., military and coast guard) are also included, but data is not consistently available and is therefore not reported separately.

SECTION C3

Food and Beverage Processing

INTRODUCTION:

The Canadian food and beverage processing industry is the link between farmers producing agricultural products and retailers, foodservice and consumers who are purchasing food products. This link has become increasingly dynamic as food and beverage processors integrate both upstream with farmers and downstream with retailers in both domestic and global markets, to provide consumers with the products and attributes they demand. The industry has faced recent challenges arising from exchange rate and commodity price volatility, tight labour markets, and the recent global economic recession which affected their input costs, export demand and competitiveness.

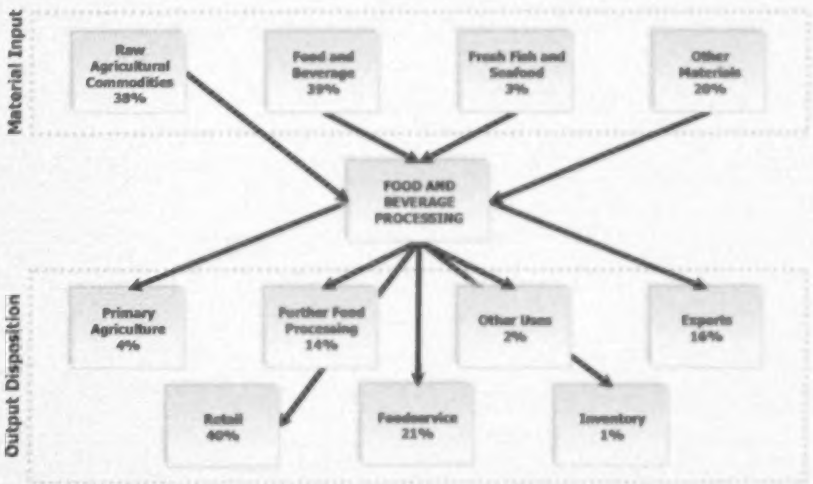
The food and beverage processing industry is a large, diverse component of the agriculture and agri-food system, and plays a key role in transforming agricultural commodities into food, feed and non-food products that are sold in Canada and around the world

- **Agricultural commodities represent about 38% of the total value of material inputs used by the food and beverage processing industry in Canada.**

  Inputs into the food and beverage processing industry that are already processed make up another 39%, while fresh fish and seafood account for another 3% of these material inputs. The remaining 20% are largely made up of other materials such as packaging materials, energy, chemical additives and equipment.

  Almost half (40%) of the output from the food and beverage processing industry is sold to Canadian food retailers, 21% is sold to domestic foodservice providers and 16% is accounted for by exports to buyers around the world. The remaining share is used by other industries in the system (i.e. primary agriculture (4%), food processing (14%) or other industries.

Chart C3.1
Food Processing Input Composition and Output Disposition
2007



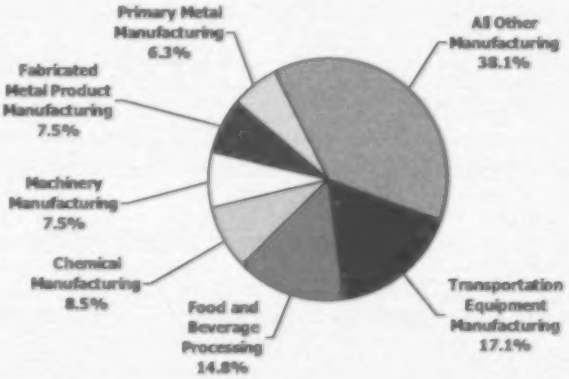
Source: Statistics Canada Input/Output Model and AAFC calculations.
Note: May not add up to 100% due to missing confidential data.

The food and beverage processing industry is one of the top manufacturing industries in Canada

- **The food and beverage processing industry was the second-largest manufacturing industry in Canada in 2010, as measured by its share of total manufacturing GDP.**

  Food and beverage processing GDP accounted for 14.8% of total manufacturing GDP at $23 billion, second only to transportation equipment manufacturing, which represented 17.1% of the total at $27 billion.

Chart C3.2
Distribution of Total Manufacturing GDP by Sector
2010

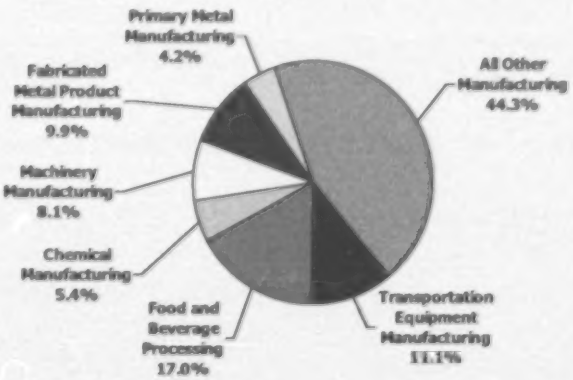

Primary Metal Manufacturing 6.3%
All Other Manufacturing 38.1%
Fabricated Metal Product Manufacturing 7.5%
Machinery Manufacturing 7.5%
Chemical Manufacturing 8.5%
Food and Beverage Processing 14.8%
Transportation Equipment Manufacturing 17.1%

Source: Statistics Canada.

- **Based on its share of total manufacturing employment, food and beverage processing ranks first, ahead of transportation equipment manufacturing.**

  This is because food and beverage processing's share of total manufacturing employment rose to 17% in 2010 employing 249,560 workers, while that of transportation equipment manufacturing remained at 11.1%, employing 162,545 workers.

Chart C3.3
Distribution of Total Manufacturing Employment by Sector
2010


Primary Metal Manufacturing 4.2%
All Other Manufacturing 44.3%
Fabricated Metal Product Manufacturing 9.9%
Machinery Manufacturing 8.1%
Chemical Manufacturing 5.4%
Food and Beverage Processing 17.0%
Transportation Equipment Manufacturing 11.1%

Source: Statistics Canada.

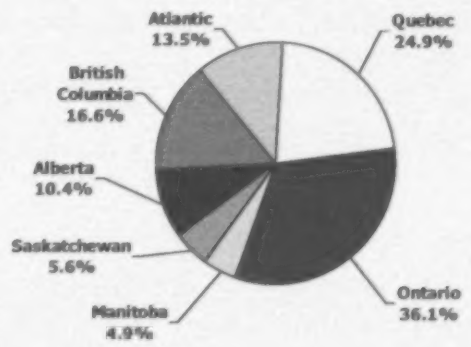
The food and beverage processing industry operates across Canada and produces a variety of products

- **Food and beverage processing has a presence in all regions, with most establishments located in Quebec and Ontario.**

  Over 8,000 food and beverage processing establishments were operating across Canada in 2009, down by almost 10% since 2004.

  Almost two-thirds of these establishments were located in Ontario (36.1%) and Quebec (24.9%). A large number of these establishments were in dairy and meat, bakery and tortilla and fruit and vegetable preserving. The other provinces with important food processing industries included British Columbia (at 16.6%), the Atlantic region (13.5%) and Alberta (10.4%).

Chart C3.4
Distribution of Food and Beverage Processing Establishments by Province
2009



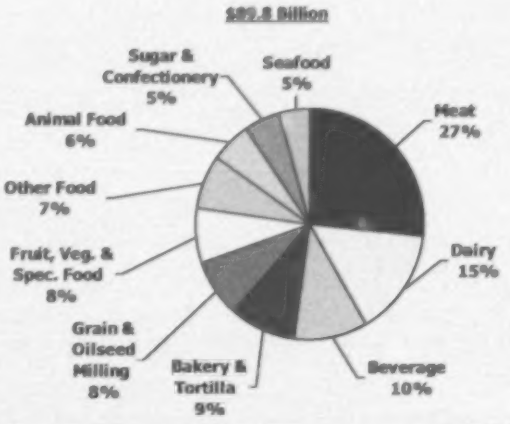
Source: Statistics Canada and AAFC calculations.

- **In 2010, processed meat products, dairy and beverages collectively accounted for over half of the $89.8 billion in total food and beverage processing shipments.**

  By shipments, the largest food and beverage processing industry is meat (27%), followed by dairy (15%) and beverage (10%).

  Meat and dairy together accounted for about 42% of the value of food and beverage processing shipments in 2010.

Chart C3.5
Distribution of Food and Beverage Processing Shipments by Sub-Industry
2010



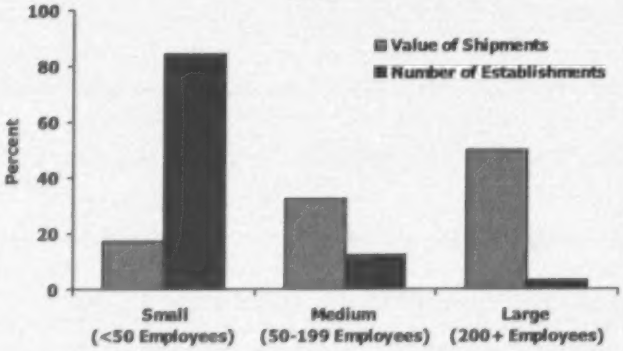
Source: Statistics Canada and AAFC calculations.

Most food processing establishments are small, with fewer than 50 employees, but large food processing establishments account for the bulk of production

- **Large food processing establishments (with 200 or more employees) produce the bulk of output. In 2008, they comprised only 3% of the total number of establishments, but accounted for 50% of the value of shipments.**

  In contrast, small establishments (with fewer than 50 employees) comprised 84% of the total number of establishments, but accounted for only 17% of the total value of shipments. Medium-sized food processing establishments represented 13% of establishments, but accounted for 33% of shipments. As the sector continues to restructure and consolidate over time, the share of production accounted for by large firms will continue to grow.

Chart C3.6
Distribution of Food Processing Shipments and Number of Establishments by Employment Size
2008



Source: Statistics Canada, special tabulation.
Note: This data is not comparable to previous information due to changes in definitions.

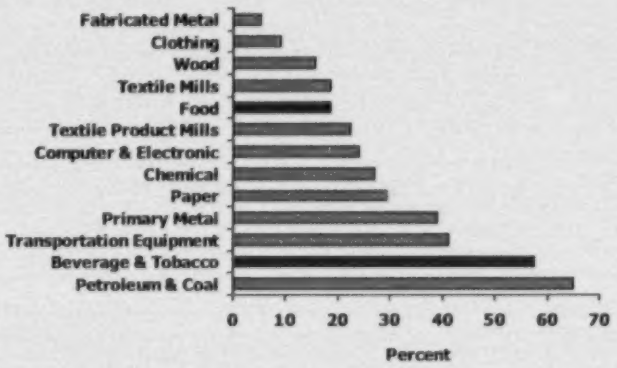
The food and beverage processing industry continues to restructure and consolidate over time as it adjusts to market conditions to remain profitable

- **The food processing industry is one of the least concentrated of manufacturing industries, while beverage and tobacco processing are some of the most concentrated.**

  Concentration is measured by concentration ratios or (CR4), which measure the proportion of sales accounted for by the top four firms in the industry. In the manufacturing sector, these ratios vary from a low of 5% in the fabricated metal industry to a high of 65% in the petroleum and coal products industry.

  Overall, the top four food processing establishments accounted for only about 20% of sales. The beverage and tobacco products industry, on the other hand, is highly concentrated with the top four firms accounting for 58% of sales.

Chart C3.7
Concentration Ratios in the Manufacturing Sector
2008



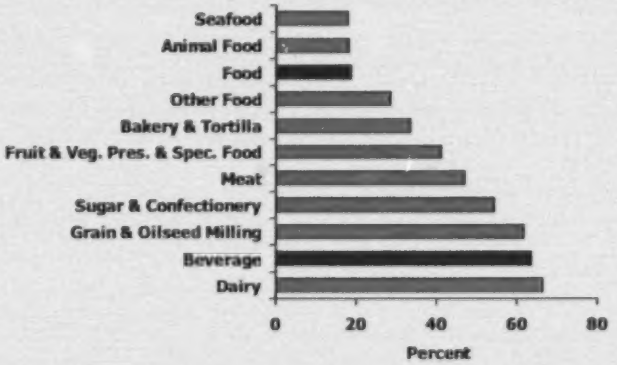
Source: Statistics Canada and AAFC calculations.

- **Concentration ratios vary across food and beverage processing sub-industries from dairy processing, the most-concentrated to the least-concentrated, which include the seafood and animal food processing.**

  The Canadian food and beverage processing industry has undergone significant structural changes since the early 1990s and has become increasingly consolidated, especially in the dairy, grain and oilseed milling and beverage processing sub-industries.

  In 2008, the four-largest dairy product processing establishments accounted for 66% of sales, while the top four beverage processing establishments and grain and oilseed milling establishments accounted for 64% and 62% of sales, respectively. On the lower end of the concentration scale, the top four seafood and animal food processing establishments accounted for only 18% of sales.

Chart C3.8
Concentration Ratios in the Food and Beverage Processing Sub-Industries
2008



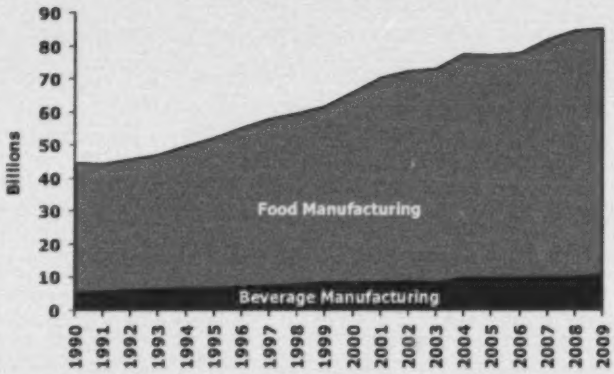
Source: Statistics Canada and AAFC calculations.

Food and beverage processing shipments have increased steadily since the 1990s, with some sub-industries growing faster than others

- **The value of food and beverage processing shipments grew to over $89.8 billion in 2010, almost double the value in 1992.**

  Even during the economic recession of 2008 and 2009, food and beverage processing shipments continued to grow. Food is a necessity, so even with income declining during the recession, consumers simply substituted restaurant meals for food from stores over this period.

Chart C3.9
Food and Beverage Processing Shipments
1990-2009



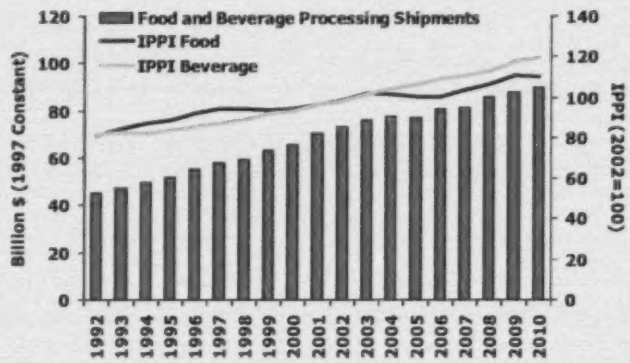
Source: Statistics Canada and AAFC calculations.

Note: 1990 to 2002 data from terminated ASML series using variable manufacturing shipments, 2003 to 2009 from current ASML series using variable revenue of goods manufactured.

- **At the same time, as the value of shipments was growing, the industrial selling prices of processed food and beverage products both trended upwards, in line with inflation.**

  Nevertheless, shipments grew more than prices, so food and beverage processing shipments were up, even in real terms.

Chart C3.10
Real Value of Food and Beverage Processing Shipments and the Industrial Product Price Index
1992-2010

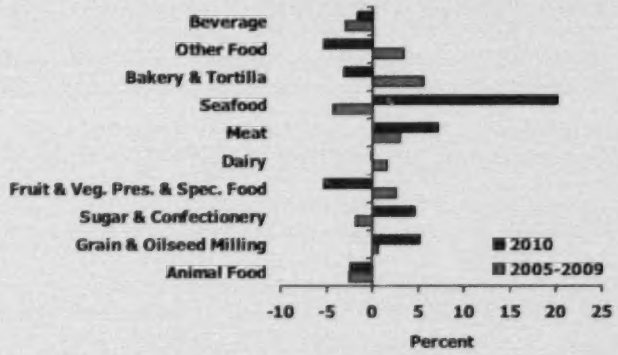


Source: Statistics Canada and AAFC calculations.

However, this growth has not been evenly distributed among the various sub-industries in the food and beverage processing industry

- **In fact, many food processing sub-industries experienced a slowdown in average annual growth rates of shipments in 2010.** For example, while seafood processing, sugar and confectionery, meat products and grain and oilseed milling shipments grew in 2010, other food processing industry shipments declined in 2010, such as for bakery, fruit and vegetable preserving and animal food processing. Most of these sub-industries had experienced positive average annual growth rates over the previous five year period, 2005-2009.

Chart C3.11
Average Annual Growth Rates in Food and Beverage Processing Shipments, by Sub-Industries 2005-2009 and 2010

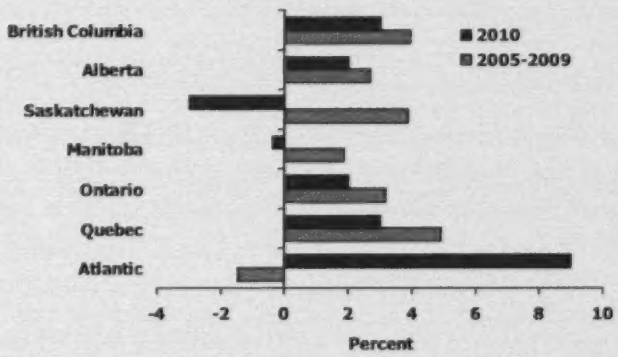


Source: Statistics Canada and AAFC calculations.

- **By province, food and beverage processing shipments grew more slowly in 2010 compared to the previous five-year period in all provinces except the Atlantic region, where higher seafood processing shipments buoyed provincial growth.**

  By province, food and beverage shipments grew more slowly in 2010 compared to 2009, than in the previous five-year period for all provinces other than the Atlantic region. This was due to the large increase in shipments (up 20%) in seafood processing. In Manitoba, shipments declined primarily due to the slowdown in vegetable (potato) and other food product processing shipments; and in Saskatchewan lower meat product shipments were the reason for the sharp decline. All other provinces experienced positive growth in shipments, albeit at slower rates than over the previous five years.

Chart C3.12
Average Annual Growth Rates in Food and Beverage Processing Shipments, by Province 2005-2009 and 2010



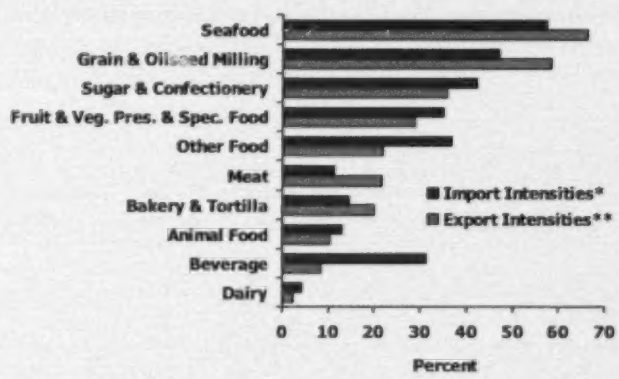
Source: Statistics Canada and AAFC calculations.

While the food and beverage processing industry sells the bulk of its products to the domestic market, some sub-industries are more dependent on trade than others

- **On average, about one-quarter of food and beverage processing shipments were exported in 2010, while food and beverage imports accounted for 23.2% of the domestic market.**

  Some of the sub-industries with the highest export intensities also have the highest import intensities, such as seafood (57.3%) and grain and oilseed milling (47.1%).

Chart C3.13
Food and Beverage Processing
Import and Export Intensities by Sub-Industries
2010



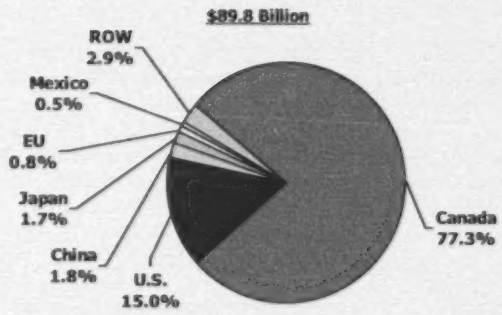
Source: Statistics Canada and AAFC calculations.
Note: * Calculated as imports/(shipments-exports+imports).
** Calculated as exports as a share of shipments.

- **The U.S. is the most important export destination for processed food and beverage products produced in Canada, followed by Asia and the EU.**

  The domestic market accounted for 77% of food and beverage processing industry shipments in 2010, followed by the U.S., which accounted for roughly 15% of the total.

  China was the next most important destination (1.8%), followed by Japan (1.7%), the EU (0.8%) and Mexico (0.5%).

Chart C3.14
Destination of Food and Beverage Processing Industry Shipments
2010



Source: Statistics Canada and AAFC calculations.

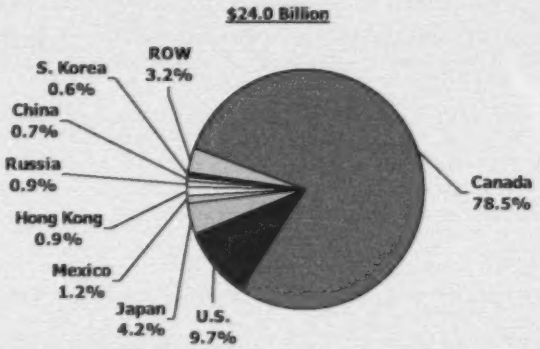
For most specific-processed food and beverage products, the primary destination is the domestic market and the most important export destination is the U.S. market

- **In 2010, the domestic market was the most important destination for over three-fourths (78.5%) of shipments from the Canadian meat processing industry.**

  Meat processors are Canada's most important exporters within the food and beverage processing industry.

  The largest export markets for processed meats include the U.S. (9.7%) and Japan (4.2%).

Chart C3.15
Destination of Meat Product Processing Industry Shipments
2010

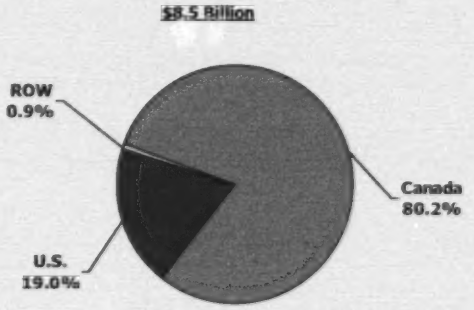


Source: Statistics Canada and AAFC calculations.

- **Similarly, for bakery and tortilla processing, a comparably large share of shipments were consumed at home (80%).**

  Exports sales were almost exclusively destined for the U.S. market.

Chart C3.16
Destination of Bakery and Tortilla Processing Industry Shipments
2010

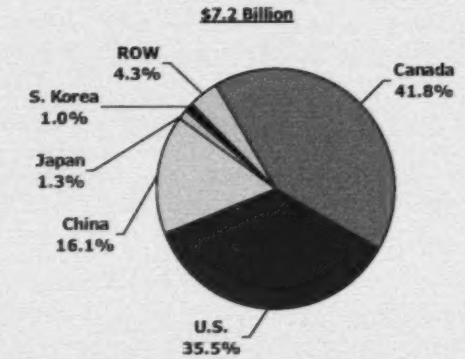


Source: Statistics Canada and AAFC calculations.

The destinations of grain and oilseed milling and seafood product industries shipments are more diversified

- **While Canada (at 41.8%) and the U.S. (at 35.5%) are the main destinations for shipments of grain and oilseed milling products produced in Canada, China now accounts for a relatively important 16% of shipments.**

Chart C3.17
Destination of Grain and Oilseed Milling Industry Shipments
2010



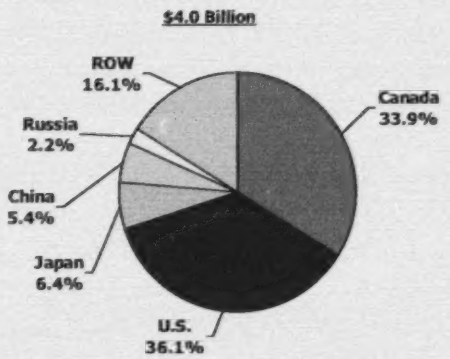
Source: Statistics Canada and AAFC calculations.

- **The seafood processing industry exhibits the greatest reliance on trade with roughly two-thirds of shipments exported in 2010.**

  The U.S. was a more important destination for seafood processing industry shipments (36.1%) than the domestic market (33.9%).

  Other important markets included Japan (6.4%), China (5.4%) and Russia (2.2%).

Chart C3.18
Destination of Seafood Industry Shipments
2010



Source: Statistics Canada and AAFC calculations.

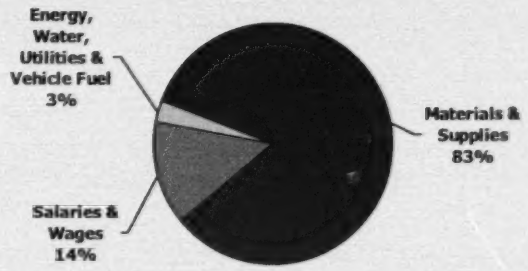
Given the importance of trade for Canadian food and beverage processing industries, it is important for them to remain competitive on costs

- **Materials and supplies are the largest component of variable costs for most food and beverage processing industries.**

  Out of total variable costs in food processing, materials and supplies were by far the largest component, accounting for 83% of total variable costs in 2009. This varies by sub-industry, for example, in meat processing, live animals account for about 60% of variable costs.

  Labour costs (salaries and wages) were the second most important cost at 14% of total variable costs, while energy, water, utilities and fuel accounted for only 3%.

Chart C3.19
Total Variable Input Costs in the Food Processing Industry 2009



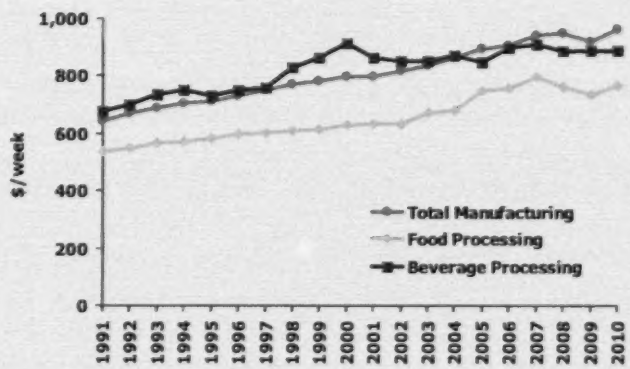
Source: Statistics Canada and AAFC calculations.

- **Labour costs, which have been on the rise in the past in both food and beverage manufacturing and in total manufacturing, have slowed more recently due to the economic slowdown.**

  Average weekly earnings in food processing have remained consistently below those in total manufacturing and beverage processing since the early 1990s.

  Tighter labour markets in the 2004 to 2006 period drove up wages and salaries in food processing, in particular. But during the 2008-2009 recession, average weekly earnings in food processing fell more dramatically than did those in total manufacturing, reducing the labour cost pressures in these industries.

Chart C3.20
Average Weekly Earnings in Food and Beverage Processing and Total Manufacturing 1991-2010



Source: Statistics Canada, special tabulation.

NOTE(S):

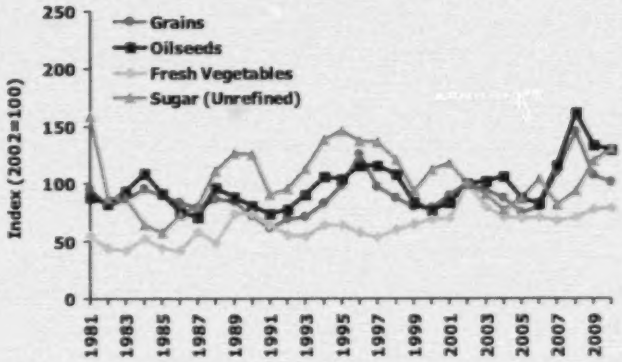
Total variable costs include all costs of production such as materials and supplies, energy and labour costs but exclude the cost of physical capital.

The impact of the sharp rise in energy and grain and oilseed prices on input costs for the food and beverage processing industry has been moderated by more stable livestock prices over the last few years

- **The cost of materials is affected by the price of raw materials, such as agricultural commodities and energy, which have risen sharply in recent years.**

  The Raw Materials Price Index (RMPI), which measures price changes for raw materials purchased by industries in Canada as inputs for further processing, increased sharply in 2008 but fell back again in 2009 and remains above historical levels. In particular, in 2010, the RMPI moderated further for grains and oilseeds and vegetables, but continued its upward trend for sugar.

Chart C3.21
Raw Materials Price Index
for Grains, Oilseeds, Vegetables and Sugar
1981-2010

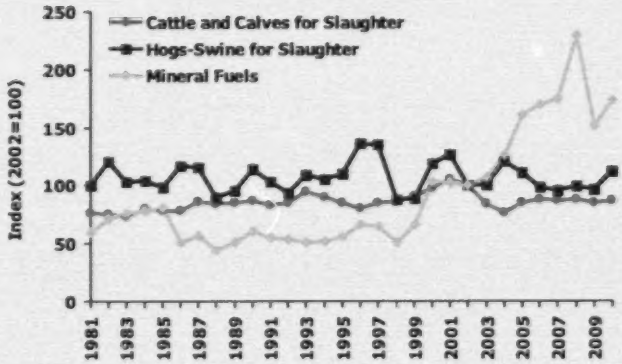


Source: Statistics Canada.

- **The RMPI for mineral fuels increased sharply in recent years before falling dramatically, while the price of cattle and hogs has been flat.**

  Because the cost of raw materials tend to account for a larger share of variable costs than do energy costs, stable prices for live animals have been helpful for food processors' bottom line.

Chart C3.22
Raw Materials Price Index
for Cattle, Hogs and Fuel
1981-2010



Source: Statistics Canada.

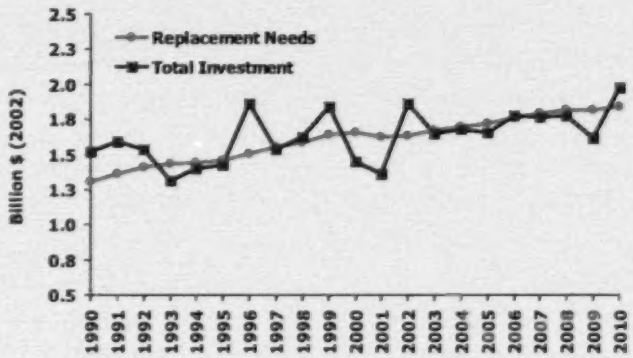
Investment in machinery and equipment in the food processing industry increased sharply in 2010, contributing to an increase in the industry's capital stock

- **Investment in capital stock is important for helping the food processing industry improve efficiency, raise productivity and lower costs.**

  The Canadian food processing industry's total investment in capital stock in constant dollar terms was $1.6 billion annually, on average, over the 1990 to 2010 period.

  This is just slightly higher than the amount of investment required to replace depreciating capital stock (i.e. replacement needs). As a result, the industry's total capital stock increased by only $40 million annually.

Chart C3.23
Investment in Capital Stock in the Food Processing Industry
1990-2010



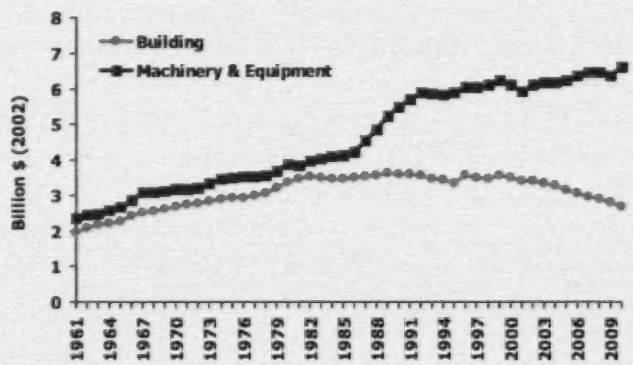
Source: Statistics Canada.

- **Capital stock in the food processing industry is the result of past capital investments and depreciation.**

  The stock of machinery and equipment in food processing rose sharply in the late 1980s and early 1990s before resuming a more steady increase. In 2010, there was a sharp rise in capital investment in machinery and equipment spurred in part by government incentives. The stock of buildings rose steadily until 2000, but has been declining ever since.

  Investment patterns in buildings, and machinery and equipment were very different over this same period. In the case of buildings, the food processing industry did not make sufficient investments to maintain its stock, leading to a decrease of $40 million annually in the real value of buildings. For machinery and equipment, the industry replaced both existing stocks and added an average of $80 million annually to the quantity of these assets.

Chart C3.24
Capital Stock in the Food Processing Industry
1961-2010



Source: Statistics Canada.

NOTE(S):

Capital stock is comprised of buildings, engineering structures, and machinery and equipment. Total investment in capital stock is made up of purchases needed to offset depreciation (replacement needs) and purchases to expand the capital stock. When replacement needs exceed investment, the capital stock falls, since the existing stock is not being maintained. When investment exceeds replacement needs, the stock increases.

Profit margins in food processing were up in 2009 and 2010, despite the recession

- **For the first time in many years, profit margins in food and soft drink processing rose above those in total manufacturing beginning in 2009 and continuing in 2010.**

  Profit margins in most manufacturing sectors dipped in 2009 due to the recession but regained strength in 2010. However, profit margins in food and soft drink processing, which have generally been below those of total manufacturing, outperformed the rest of the manufacturing industry in 2010.

  Food, as a necessity, generally continues to be purchased regardless of recessions, while other products such as durable goods (e.g. cars or appliances) experience declines. This contributed to reduced profit margins in total manufacturing in 2009.

Chart C3.25
Profit Margins in Food and Soft Drink Processing and Total Manufacturing 1999-2010

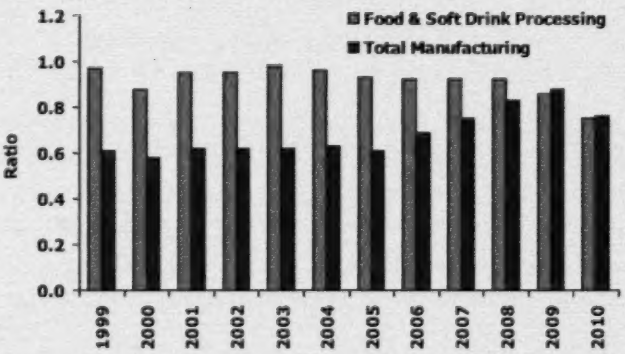
Source: Statistics Canada and AAFC calculations.

- **The financial position of both food and soft drink processing and total manufacturing is reflected in industry debt to equity ratios, which have fallen in 2010 after having peaked in 2009.**

  The food and soft drink processing industry's debt to equity ratio fell to its lowest level in over a decade in 2010, in line with that of the total manufacturing sector.

  Credit markets still remained tight in 2010 making debt-financing more of a challenge for all borrowers.

Chart C3.26
Debt to Equity Ratio in Food and Soft Drink Processing and Total Manufacturing 1999-2010



Source: Statistics Canada and AAFC calculations.

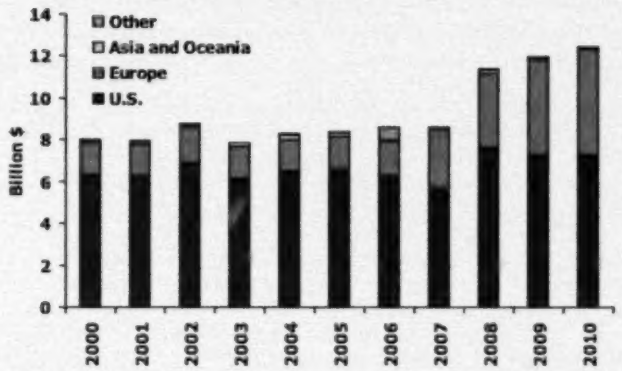
Foreign direct investment (FDI) is an important source of capital investment and innovation in the Canadian food and beverage processing industry

- **The stock of inward FDI in Canadian food processing in 2010 totalled $12.4 billion.**

  The U.S. accounted for 59% of Canada's stock of inward FDI for food processing in 2010, and Europe accounted for another 40%.

  Europe's share has been growing over time while the share of FDI from the U.S. has been declining since 2008.

Chart C3.27
Stock of Inward FDI in the Food Processing Industry
by Source Country
2000-2010

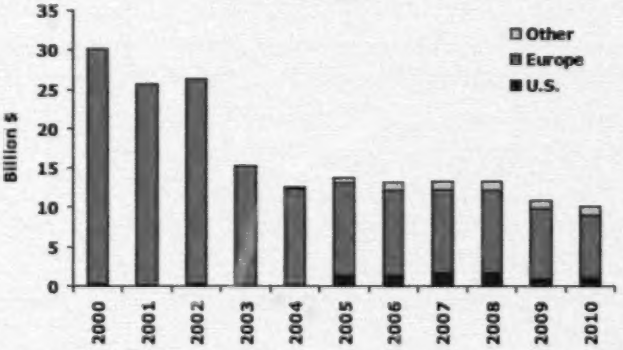


Source: Statistics Canada and AAFC calculations.
Note: Figures for the latest year are estimates and subject to revision by Statistics Canada.

- **The stock of FDI in the Canadian beverage and tobacco processing industry originated mostly from Europe.**

  The stock of FDI in the Canadian beverage and tobacco processing industry totalled $10.3 billion in 2010.

Chart C3.28
Stock of Inward FDI
in the Beverage and Tobacco Processing Industry
by Source Country
2000-2010



Source: Statistics Canada and AAFC calculations.
Note: Figures for the latest year are estimates and subject to revision by Statistics Canada.

NOTE(S):

FDI refers to an investment made by a non-resident entity (an individual or a public or private enterprise) through investment, mergers and acquisitions or purchasing of shares, so as to obtain a 10% or greater equity stake in an enterprise resident in another country.

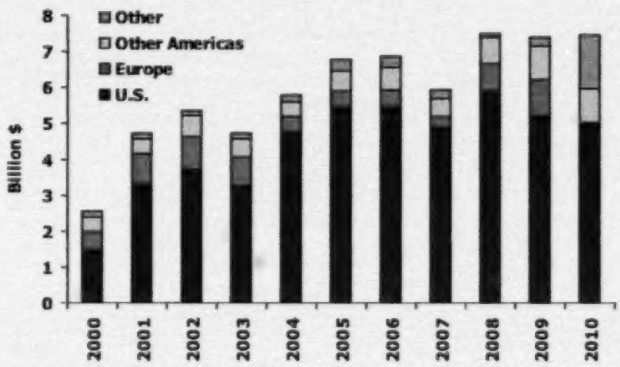
Inward investment means investment into a Canadian entity by a foreign entity, while outward investment means investment made by a Canadian entity in a foreign entity.

The Canadian food processing industry has also been investing abroad

- **Canadian investments in the U.S. accounted for two-thirds of the total stock of Canadian outward FDI in food processing in 2010.**

  Investments in regions outside of the Americas and Europe grew in 2010, while investments in Europe declined.

Chart C3.29
Stock of Outward FDI in the Food Processing Industry by Country of Destination 2000-2010



Source: Statistics Canada and AAFC calculations.
Note: Figures for the latest year are estimates and subject to revision by Statistics Canada.

SECTION C4

Primary Agriculture

INTRODUCTION:

Agricultural producers are the foundation of the agriculture and agri-food system and have direct links to all stages in the supply chain. They contribute significantly to the economic growth and activity of the Canadian economy through these linkages. Developments in commodity markets and in other sectors in the chain, such as in production and price trends for farm inputs, food processing, food retail and foodservice, all have impacts on the structure and performance of primary agriculture. Recent commodity price volatility and increases have had both positive and negative impacts on these sectors.

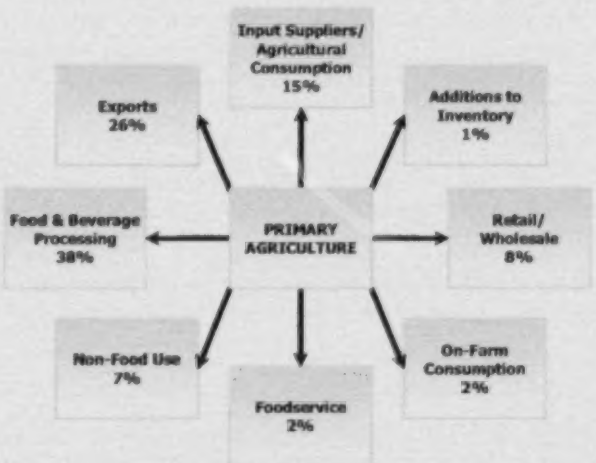
At a more disaggregated level, farmers are diverse with different business strategies and management skills, differing by farm size, type and region. This diversity explains the differences in performance between farms.

Agricultural producers have direct links to all the stages in the agri-food supply chain

- **Thirty eight percent of the value of agricultural products available in Canada in 2007 was used by the Canadian food and beverage processing industry, which was the single most important market for agricultural products.**

  Agricultural producers have many alternative marketing choices. In 2007, 26% of farm production was exported directly (apart from that which was indirectly exported as processed food products), 15% was consumed within primary agriculture (as feed, seeds, etc.), and 10% was distributed directly to consumers through retail and on-farm sales (consisting mostly of fresh fruits and vegetables). Another 7% was directed to non-food uses (consisting mostly of nursery stock, flowers and other horticultural products for residential construction and consumers; and bioproducts).

Chart C4.1
Disposition of the Value of Agricultural Production
2007



Source: Statistics Canada Input/Output Model and AAFC calculations.

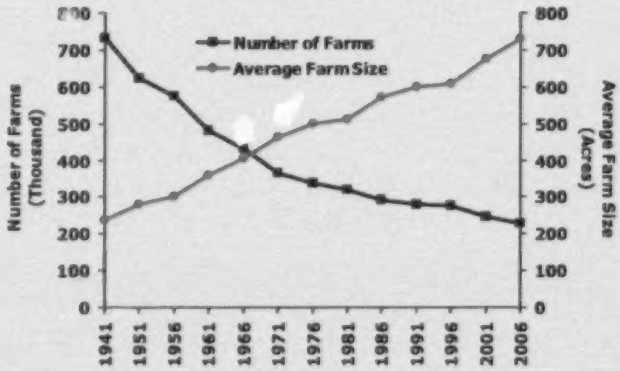
Primary agriculture is a modern, dynamic sector, which continues to restructure and adapt to changing global and domestic economic conditions

- **Over the past 60 years, average farm size has almost quadrupled while the number of farms in Canada has declined.**

  In 2006, there were 229,373 farms, representing a 7% decline from 2001. This compares to a 11% decline between 1996 and 2001.

  At the same time, the average farm size is becoming larger. Technological advances and increased productivity growth have enabled an increasing scale of operation and consolidation.

Chart C4.2
Number and Size of Farms in Canada
1941-2006



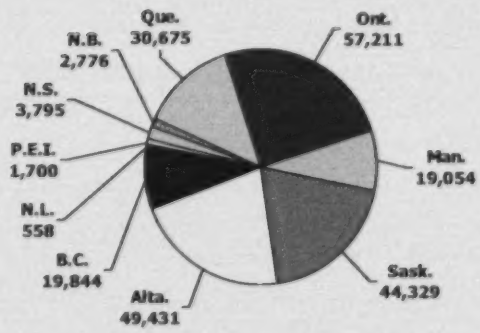
Source: Statistics Canada, Census of Agriculture, various years.

- **The number of farms continued to decline in all provinces in 2006.**

  In 2006, Ontario had the most farms at 57,211, followed by Alberta at 49,431 and Saskatchewan at 44,329.

  Saskatchewan, and Newfoundland and Labrador reported the largest decline in the number of farms between 2001 and 2006 at 12% and 13%, respectively. British Columbia reported the smallest decline, at 2% over the same period.

Chart C4.3
Distribution of Farms by Province
2006



Source: Statistics Canada, 2006 Census of Agriculture.

Canada produces a diverse set of commodities, which vary by province

In British Columbia, agricultural production is dominated by horticulture due to its milder climate and longer growing season.

The Prairie Provinces produce the bulk of Canada's red meat and grains and oilseeds. Alberta and Manitoba are the top cattle and hog-producing provinces, respectively, while Saskatchewan is the largest producer of grains and oilseeds.

Ontario and Quebec are the major dairy producing regions of Canada. Ontario also produces most of Canada's corn and soybeans. Quebec is the largest pork producer apart from the Prairie Provinces.

In Atlantic Canada, horticulture production dominates, led by potatoes. Dairy production is also important.

Chart C4.4
Top Commodities by Province and Territory

Source: AAFC.

Over time, the commodity mix has been changing by product and by region

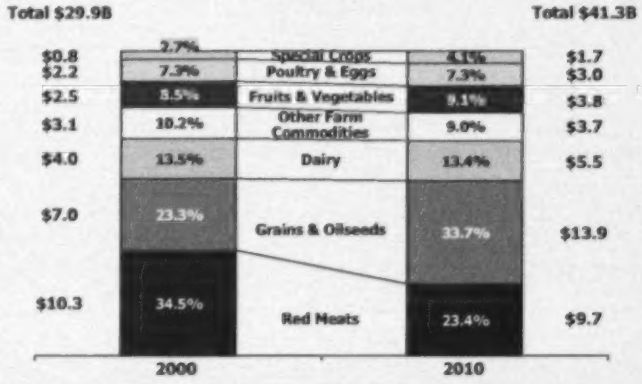
- **The distribution of market receipts across commodities has changed since 2000.**

  Market receipts in 2010, at $41.3 billion, were over $11 billion higher than the 2000 level. In 2010, grain and oilseed receipts rose as a share of the total because of increasing prices, while the importance of red meats fell.

  Market receipts from special crops, which include mustard, sunflower and canary seeds, more than doubled between 2000 and 2010, while their market share increased from 2.7% to 4.1%.

  The share of market receipts for poultry and eggs and dairy products remained stable over this period, while that of fruits and vegetables, including potatoes, rose.

Chart C4.5
Market Receipts by Commodity Share
2000 and 2010



Source: Statistics Canada.

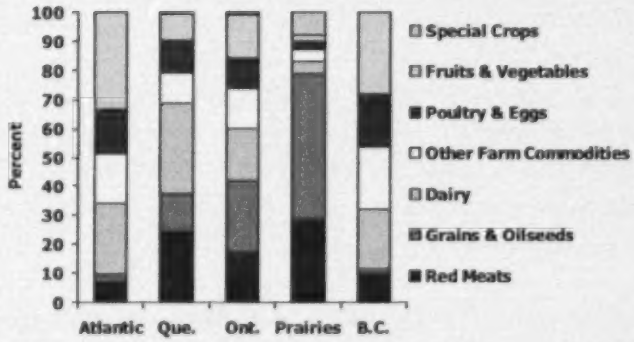
- **The distribution of market receipts among commodities varies by region and province.**

  On the Prairies, grains and oilseeds accounted for the largest share of regional market receipts (50%), followed by red meats (29%). In British Columbia, fruits and vegetables, dairy and other farm commodities, such as floriculture and nursery, accounted for 70% of that province's market receipts, while red meats and grains and oilseeds only accounted for 12% of market receipts.

  In Quebec, dairy and red meats were more important, accounting for more than 56% of market receipts in that province. In Ontario, grains and oilseeds, dairy and red meats accounted for the bulk of provincial market receipts (60%).

  In the Atlantic Provinces, fruits and vegetables accounted for 33% of that region's market receipts in 2010, followed by dairy, at 25%.

Chart C4.6
Regional Market Receipts
by Commodity Share
2010



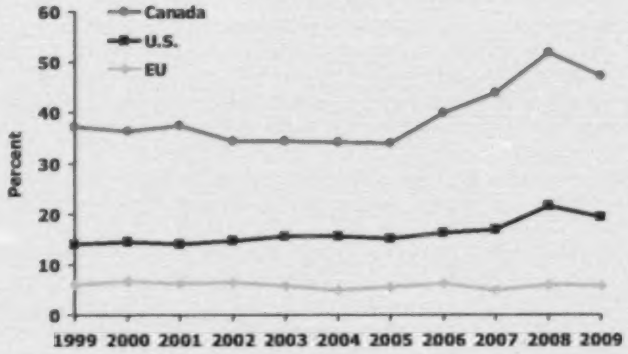
Source: Statistics Canada.

The Canadian agriculture and agri-food sector is very export oriented

- **In 2010, Canada exported a large share of its agriculture and agri-food products.**

  About 45% of agricultural production was destined for export markets, compared to less than 20% in the U.S., and 5% in the EU.

Chart C4.7
Export Values as a Share of Market Receipts
Canada, the U.S. and the EU
1999-2009



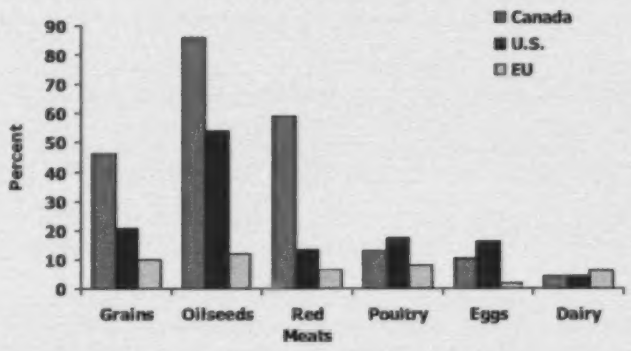
Source: OECD, World Trade Atlas and AAFC calculations.

- **The Canadian grain, oilseed and red meat industries are very export dependent relative to their competitors.**

  On average, between 2007 and 2009, Canadian grain, oilseed and red meat producers exported 46.4%, 85.6% and 58.9% of their production volumes, respectively. This compares to 20.7%, 54% and 13.5% for the U.S., and 9.9%, 12% and 6.7% for the EU.

  Canadian poultry, egg and dairy production is primarily produced for the domestic market.

Chart C4.8
Export Volumes as a Share of Production
Canada, the U.S. and the EU
2007-2009



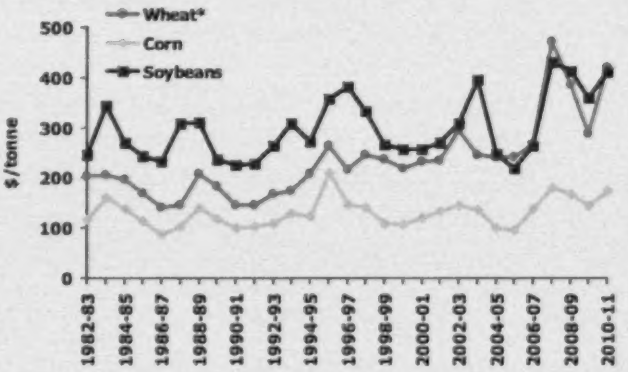
Source: OECD, World Trade Atlas and AAFC calculations.

In the latter half of 2010, commodity prices rose once again, impacting both the crop and livestock sectors

- **In 2010-11, stronger grain and oilseed demand, stimulated by the world economic recovery, a continuation of favourable ethanol policy in the U.S., difficult climatic conditions and export bans, led to another world price spike.**

  During this period, the appreciating Canadian dollar partially mitigated grain and oilseed price increases in Canada.

Chart C4.9
Canada Corn, Wheat and Soybean Prices
1982-83 to 2010-11



Source: Canadian Wheat Board and University of Guelph, Ridgetown College.

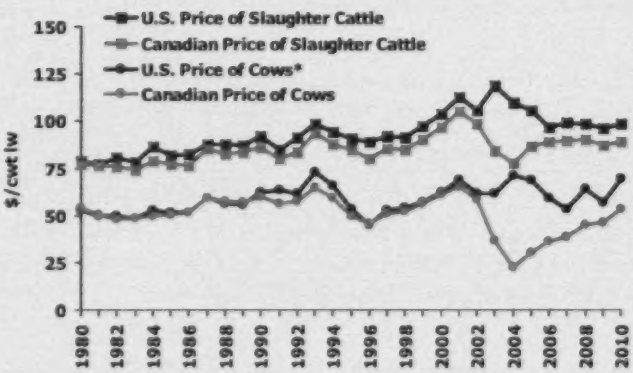
Note: * Canada Western Red Spring.
Data for 1982-83 to 1993-94 are AAFC estimates, based on prices for 1CWRS, 11.5% protein.

- **Canadian cattle prices are strengthening but are still below historical peaks.**

  Historically, cattle prices in Canada and the U.S. have moved fairly consistently together. However, starting with the ban on trade in live cattle with the U.S., following the BSE outbreak in 2003, a gap in prices was created between Canada and the U.S.

  With the resumption of trade in 2005 for cattle under 30 months of age, and in 2008 for animals over 30 months of age, the gap in prices has narrowed somewhat. However, the implementation of Country of Origin Labelling (COOL) in 2008 in the U.S. negatively affected the Canadian price of slaughter cattle, and the gap widened again. In 2010, cattle prices strengthened but remained below their cyclical peaks.

Chart C4.10
Cattle Price Cycle
1980-2010



Source: USDA ERS, Canfax and AAFC calculations.

Note: * This series was terminated in 2008, the 2009-10 values are estimated from the annual growth of national direct cow price.

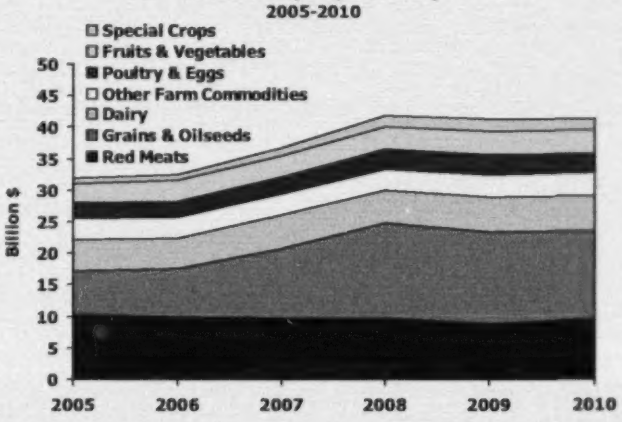
Market receipts stabilized in 2010

- **Market receipts, at $41.3 billion, were unchanged in 2010 compared to the previous year, yet were 12% higher than the previous five-year average.**

  Crop receipts declined 3% in 2010. Poultry and eggs and special crops also experienced declines in market receipts in 2010 following high values in 2009.

  In 2010, livestock receipts increased by 4%. Cattle and calf receipts were 5% higher, while hog market receipts increased by 15% over the previous year. Smaller increases were observed for dairy, fruits and vegetables and other farm commodities, which include forage and grass seed, hay, clover and honey.

Chart C4.11
Market Receipts by Commodity
2005-2010

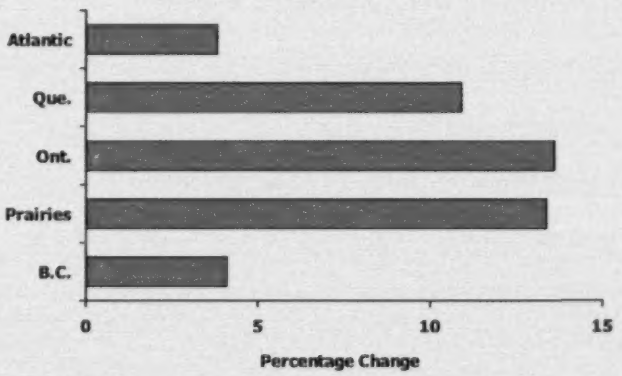


Source: Statistics Canada.

- **Despite market receipts stabilizing in 2010, it was still a relatively good year for producers in all regions of Canada, as receipts remained well above the previous five-year average (2005-2009).**

  Compared to other regions, Ontario and the Prairies experienced the largest gains in 2010, with market receipts in these provinces averaging over 13% above the 2005-2009 average due to higher livestock receipts.

Chart C4.12
Regional Market Receipts
Relative to Five-Year Average
2010



Source: Statistics Canada.

At the same time, farm operating expenses declined slightly, leading to a small increase in net cash income

- **In 2010 farm cash receipts, which include direct program payments, amounted to $44.4 billion. This was relatively unchanged from 2009, but above its five-year average (2005-2009).**

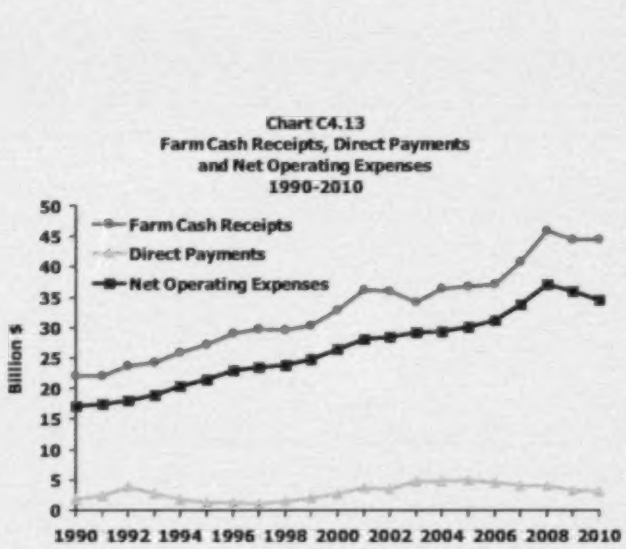
  Farm cash receipts were more or less stable, declining by less than 0.5% in 2010 following a 3% decline in 2009. They had registered a year-over-year increase of over 10% in both 2007 and 2008, driven mainly by strong crop market receipts.

  Net operating expenses, which were rising steadily throughout the 1990s and 2000s, declined by 4% in 2010, after having also declined in 2009.

  Direct payments declined to $3.1 billion in 2010, continuing the downward trend since the peak in 2005. Direct payments are used to stabilize farm income and to offset production losses from natural disasters.

  Lower costs, improvements in commodity prices and higher margins have led to a reduction in program payments.

Chart C4.13
Farm Cash Receipts, Direct Payments and Net Operating Expenses
1990-2010

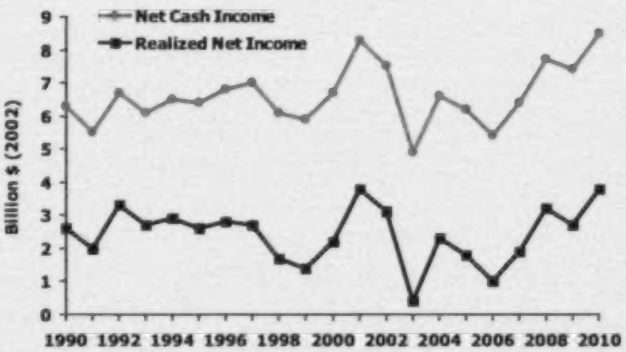


Source: Statistics Canada and AAFC calculations.

- **After adjusting for depreciation and inflation, realized net farm income increased by 43% in 2010 over 2009, following a 17% decrease in 2009.**

  Net cash income (adjusted for inflation) rose by almost 15% in 2010, following a 4% decrease in 2009.

Chart C4.14
Realized Net Income and Net Cash Income (Adjusted for Inflation)
1990-2010



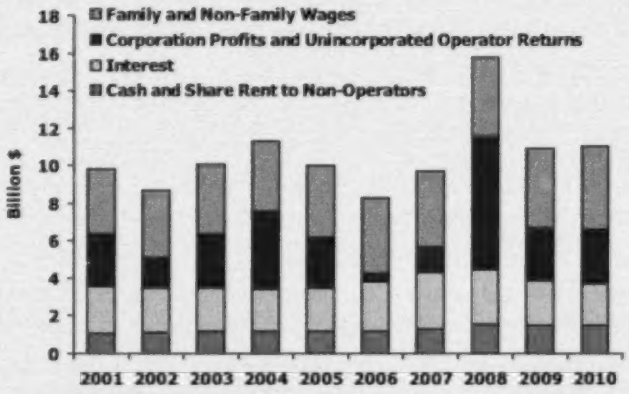
Source: Statistics Canada and AAFC calculations.

Similarly, net value-added in agriculture rose in 2010

- **Net value-added in agriculture increased by about 1% in 2010 following a decline in 2009, down from its record high of $15.8 billion in 2008.**

  Net value-added measures the value of economic production in the agriculture sector, and reflects the return to all factors of production (e.g. rent to land, wages to labour, and interest to capital). In 2010, the distribution of net value-added to the factors of production remained relatively stable compared to previous years.

Chart C4.15
Net Value-Added in Agriculture
2001-2010



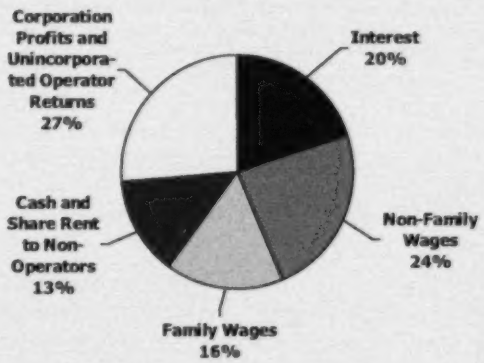
Source: Statistics Canada and AAFC calculations.

- **The distribution of net value-added to the various factors of production changed marginally in 2010.**

  Although there was a substantial drop in unincorporated operator returns and a substantial increase in corporate profits, the other factors of production saw smaller changes. There were small declines in cash and share rent to non-operators and interest payments, while wages paid to family and non-family members increased slightly.

  The share of net value-added that went to corporate profits and unincorporated operator returns was up slightly in 2010, accounting for 27% of net value-added, compared to 25% in 2009. A slightly lower share (13%) of value-added was distributed to non-operator landowners in the form of rent, down from 14% in 2009. Interest accounted for a slightly lower share (20%) of net value-added, down from 22% in 2009. Finally, wages paid to family members remained at 16% as a share of total net value-added, while wages paid to non-family members rose from 23% to 24%.

Chart C4.16
Distribution of Net Value-Added in Agriculture
2010


Corporation Profits and Unincorporated Operator Returns 27%
Interest 20%
Non-Family Wages 24%
Family Wages 16%
Cash and Share Rent to Non-Operators 13%

Source: Statistics Canada and AAFC calculations.

NOTE(S):

Net value-added in agriculture measures the value of economic production in the Canadian agriculture sector and is calculated by subtracting costs of production from the total value of agricultural sector production. It reflects the return to the various factors of production, including rent to non-operator landlords, interest to lenders and wages to family and non-family members, as well as profits to corporations and unincorporated operators.

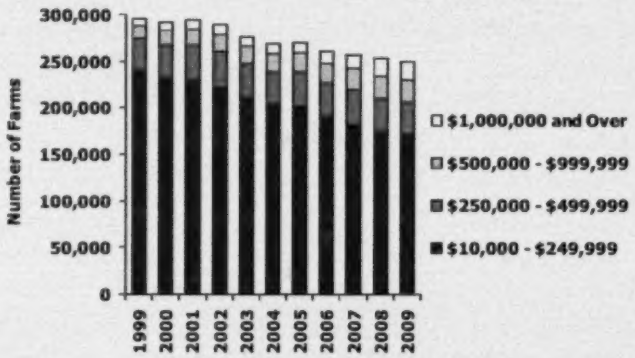
A more disaggregated picture of the agriculture sector shows that farms are getting larger and more diverse

- **The very largest farms (with revenues of $1 million and over), which traditionally have accounted for a very small share of the total, continue to grow in importance.**

  These farms have expanded from 2.3% of the total in 1999 to 7.5% in 2009.

  Small and medium-sized farms with revenues between $10,000 and $249,999, which still accounted for the largest number of farms, experienced declines in importance between 1999 and 2009, from over 80% of the total to almost 70%.

Chart C4.17
Number of Farms by Revenue Class
1999-2009



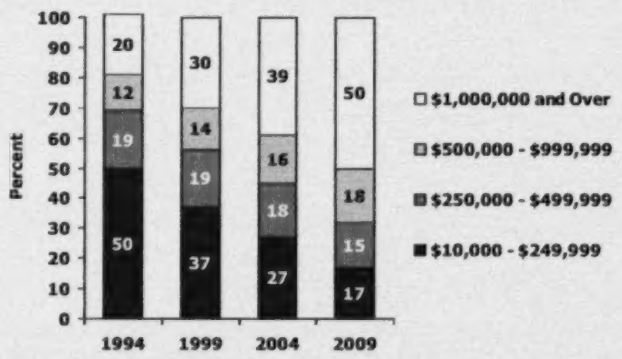
Source: Statistics Canada, Taxation Data Program.

- **Over time, large farms are accounting for an increasing share of revenues.**

  In 2009, small and medium sized farms, with revenues from $10,000 to $249,999, accounted for a much smaller share of operating revenues (17%) than they had in 1994 (50%).

  Farms with revenues of $1 million and over accounted for half of farm operating revenues, up from 20% in 1994.

Chart C4.18
Distribution of Total Operating Revenues by Revenue Class
1994-2009



Source: Statistics Canada, Taxation Data Program.

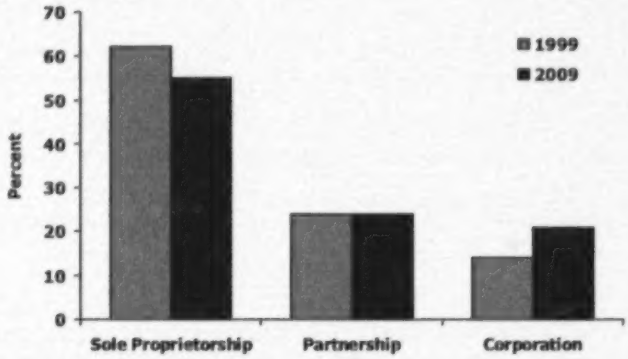
In addition to getting larger, an increasing share of farms are incorporating

- **In 2009, a little more than half of Canadian farms were sole proprietorships, compared to almost two-thirds in 1999.**

  Over the last 10 years, there has been a change in farm organization structure with an increase in incorporated farms and fewer sole proprietorships.

  As a result, sole proprietorships decreased by 7%, incorporated farms increased by 7% and partnerships remained steady at 24% of Canadian farms.

Chart C4.19
Distribution of Farms by Business Organization
1999 and 2009



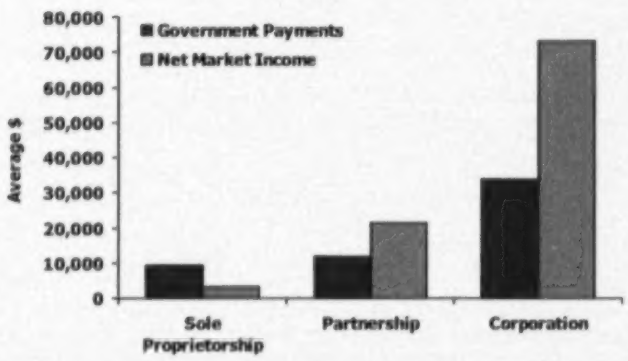
Source: Statistics Canada, Farm Financial Survey, 1999 and 2009.
Note: Excludes co-ops and communal operations.

- **Incorporated farms generated the highest average net market income in 2009, at more than $73,000 per farm, while government payments were half of that at $34,000, on average.**

  For partnerships, government payments were also around half of that of net market income.

  For sole proprietorships, government payments were more than double net market income, on average in 2009.

Chart C4.20
Net Market Income and Government Payments
by Business Organization
2009



Source: Statistics Canada, Farm Financial Survey, 2009.
Note: Excludes co-ops and communal operations.

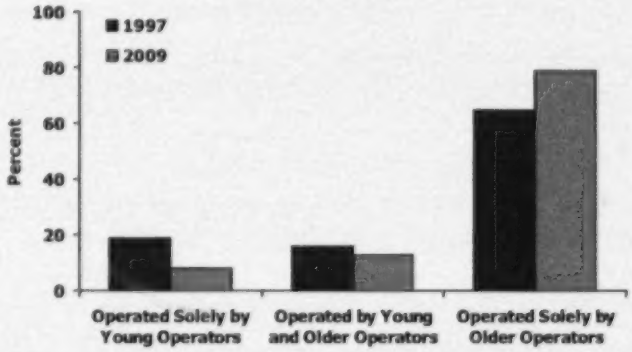
Young Farmer Enterprises (YFEs), while small in number, are important for the future of the sector

- **Close to 8% of Canadian farms are managed solely by young farmer enterprises, whose operators (one or more) are between 18 and 39 years of age and they had an average of 12 years of farming experience.**

  Between 1997 and 2009, the percent of farms operated solely by young farmers decreased, while those operated by older farmers has increased as the population has aged.

  The decision to enter farming depends on many factors including the attractiveness of farm versus non-farm employment. Attracting young farmers to agriculture is important since it will ensure that there will be a future sector.

Chart C4.21
Distribution of Farms
by Young Operators and Older Operators
1997 and 2009



Source: Statistics Canada, Farm Financial Survey, 1997 and 2009.
Note: Young farmers are defined as those operators between 18 and 39 years of age.

- **When all income sources are considered, YFEs earn only slightly less than do other farms.**

  YFEs earned, on average, almost half of their family income from the farm and less from non-farm sources than did other farms. YFEs earned $44,578 from farm sources compared to $42,775 for other farms.

  For non-farm income, YFEs earned $53,143 from non-farm sources versus the $56,361 that other farms earned. Other farms earned more income from investments and/or pensions, at $19,367 compared to $10,550 for YFEs.

  As a result, total family income in 2009 was almost the same for YFEs and for other farms at $97,721 and $99,136, respectively.

Chart C4.22
Sources of Farm Family Income for YFEs and Other Farms
2009

	YFEs	OTHER FARMS
Family share of net operating income*	36,653	32,914
Farm wages and salaries paid to family	7,925	9,861
Total farm sources of income	44,578	42,775
Non-farm employment income	42,593	36,994
Other non-farm income (investment, pension etc.)	10,550	19,367
Total non-farm income	53,143	56,361
TOTAL FAMILY INCOME	**97,721**	**99,136**

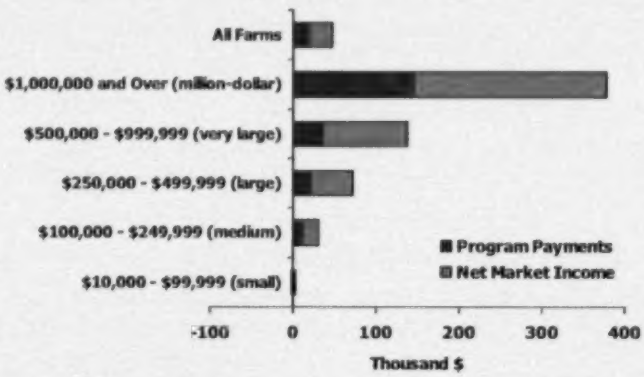
Source: Statistics Canada, Farm Financial Survey, 2009.
Note: *Family share of net operating income before capital cost allowance.

Farm level performance, as measured by average net operating income, varies by farm size and province

- **In 2009, average net operating income was $47,100 per farm.**

  Average net operating income varied from $1,900 for small farms (with revenues of $10,000 to $99,999) to $377,700 for million-dollar operations. For these larger farms, 61% of their operating income came from the market with the remainder coming from program payments. For medium to very large farms (with revenues of $100,000 to $999,999), net market income was also the predominant source of income.

Chart C4.23
Average Net Operating Income by Revenue Class
2009



Source: Statistics Canada, Taxation Data Program.

- **British Columbia tends to have the highest percentage of small farms, consequently it is the province with the lowest average net operating income.**

  Newfoundland and Labrador had the highest net operating income per farm in 2009 followed by New Brunswick and Manitoba.

  The importance of program payments also differs by province. In 2009, Ontario reported the lowest share of operating income from program payments, while Quebec reported the highest.

Chart C4.24
Average Net Operating Income by Province
2009

Source: Statistics Canada, Taxation Data Program.

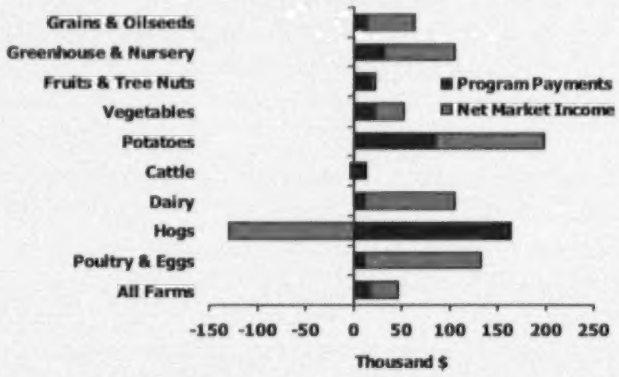
Similarly, average net operating income varies by farm type

- **Average net operating income varies across farm types, and is influenced to a large degree by prices and market conditions.**

  On average, potato, poultry and dairy farms reported the highest average net operating income among farm types in 2009.

  Cattle and hog farms reported the lowest average net operating income among all farm types in 2009. Hog farms, in particular, faced serious financial difficulty and negative net market revenues due to a variety of factors, including record high feed prices and reduced export demand due to an appreciated dollar. Various programs were in place to help address their difficulties and offset these negative market revenues.

Chart C4.25
Average Net Operating Income by Farm Type
2009



Source: Statistics Canada, Taxation Data Program.

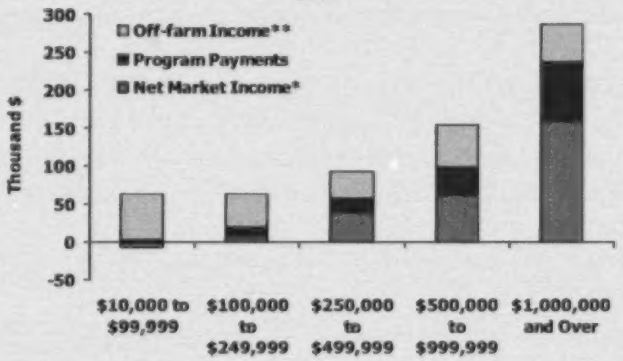
For Canadian farm families, income from off-farm sources continues to be important regardless of farm size

- **In 2009, all farm families reported some off-farm income. However, families on small farms (with revenues between $10,000 and $99,999) tended to rely almost exclusively on off-farm income sources.**

  For smaller farms, income from other sources, along with program payments are more than enough to offset negative and low net market income.

  As farms get larger, however, farm families tend to report a larger share of their income from the market and/or program payments versus off-farm sources.

Chart C4.26
Average Income of Farm Families by Source of Income
(Unincorporated Farms)
2009



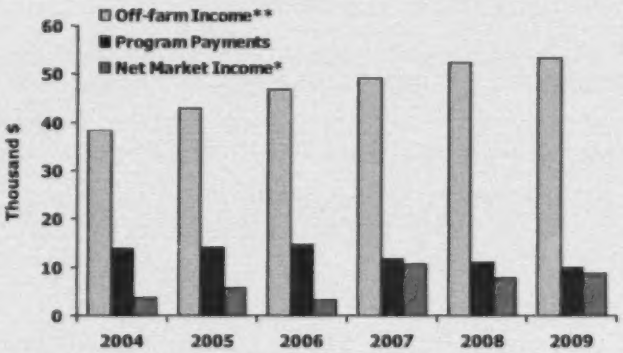
Source: Statistics Canada, Farm Financial Survey, 2009.

Note: * Net market income does not include capital cost allowance.
Farm wages paid to family members are treated as an expense to the farm operation; they are also recorded as income to the family by including them in salary & wage income under off-farm income.
Program premiums are treated as an expense to the farm operation, and are not netted out of program payments.
** Off-farm income is based on Farm Financial Survey data and is averaged over all farms.

- **The proportion of family income from off-farm sources, from the farm and from government payments varies from one year to another depending on market conditions.**

  From 2004 to 2009, an increasing share of family income came from off-farm income as market income and program payments fell, particularly after 2007.

Chart C4.27
Average Income of Farm Families by Source of Income
(Unincorporated Farms)
2004-2009



Source: Statistics Canada, Farm Financial Survey, 2004-2009.

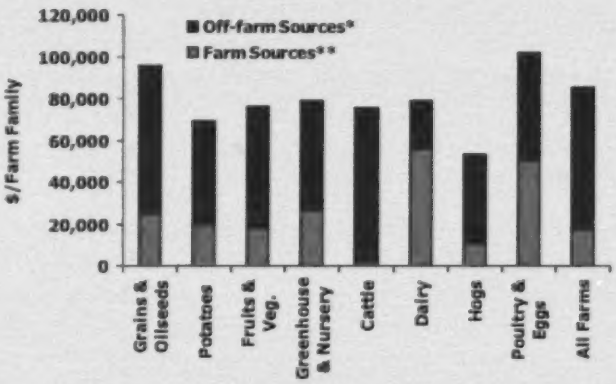
Note: * Net market income does not include capital cost allowance.
Farm wages paid to family members are treated as an expense to the farm operation; they are also recorded as income to the family by including them in salary & wage income under off-farm income.
Program premiums are treated as an expense to the farm operation, and are not netted out of program payments.
** Off-farm income is based on Farm Financial Survey data and is averaged over all farms.

Farm family income varies by farm type as well

- **Farm families on dairy and poultry and egg farms tend to rely less on off-farm income than do other farm types.**

  This is because dairy, poultry and egg farms tend to be more labour intensive than other farm types. Families operating cattle (primarily cow-calf) and grain and oilseed farms reported a higher proportion of their income from off-farm sources. These farm types tend to be less labour intensive, allowing for part-time employment by family members.

Chart C4.28
Average Farm Family Income by Farm Type
2008



Source: Statistics Canada, Taxation Data Program, Unincorporated Farm Families and AAFC calculations.

Note: * Includes Non-Farm Wages and Salaries and Non-farm Self-employment Income.
** Includes Net Farm Income + Farm Wages and Salaries.

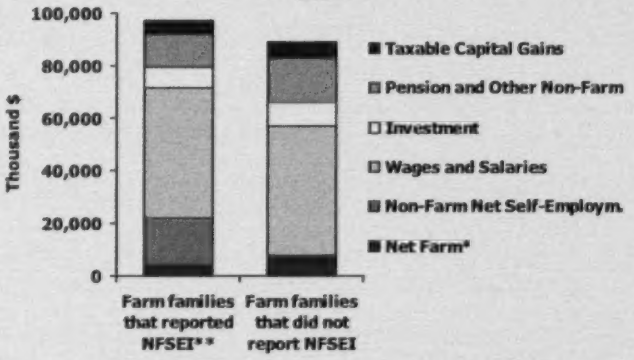
Non-farm sources of income, including non-farm self-employment income, are important to many farm families

- **In 2008, average family income was higher for unincorporated farms that reported some non-farm self-employment income.**

  Some farm families reported self-employment income that was not related to farming. These families reported average non-farm net self-employment income of $17,800 in 2008.

  These farm families also reported higher average total family income at $97,230 compared to $88,923 per family for those not reporting this income. Income from other sources, such as investment income and non-farm wages and salaries, were very similar for the two groups. Pension income, on average, was about $5,000 more for those families that did not report non-farm net self-employment income. Those farm families reporting non-farm net self-employment income earned less income from the farm.

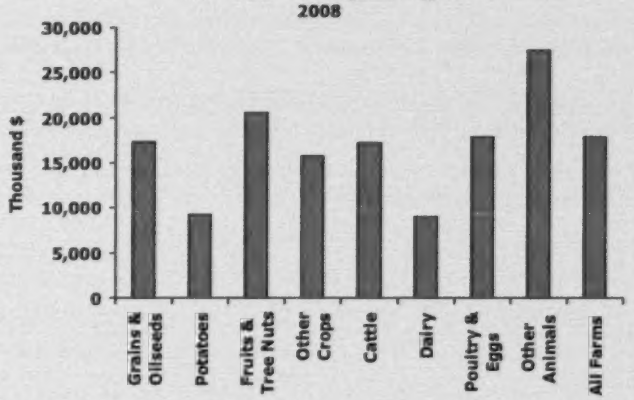
Chart C4.29
Sources of Off-Farm Income for Farm Families (Unincorporated Farms) 2008



Source: Statistics Canada, Whole Farm Database, Taxation Data Program.
Note: * Farm net operating income adjusted for CCA.
** Non-farm self-employment income.

- **By farm type, those farm families with the highest average non-farm net self-employment income are fruit and tree nut farms ($20,600) and other animal farms ($27,600).** The average for all farm types was $17,800. Families operating potato and dairy farms, in particular, reported a lower average level of income from this source at $9,260 and $9,080, respectively. These farm types are more labour-intensive, leaving less time for family members to establish other sources of income.

Chart C4.30
Average Non-Farm Net Self-Employment Income for Farm Families by Farm Type 2008



Source: Statistics Canada, Whole Farm Database, Taxation Data Program.

NOTE(S):

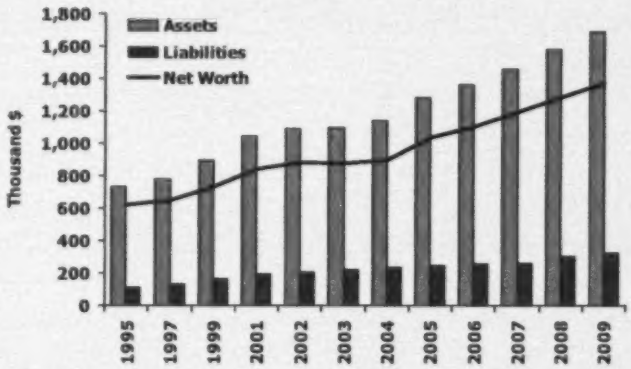
Non-farm net self employment income is a source of off-farm income for farm families. It comes from self-employment income not associated with farming. So, for example it can be related to a small business other than farming.

Overall, the financial performance of farms takes into account both income and net worth measures

- **Average net worth per farm, which is measured by assets net of liabilities, has been rising over time.**

  In Canada, average net worth per farm continued to increase steadily over the last few years after stabilizing in 2003. In 2009, average net worth per farm was $1.4 million, up 7% over 2008.

Chart C4.31
Average Farm Total Net Worth
1995-2009



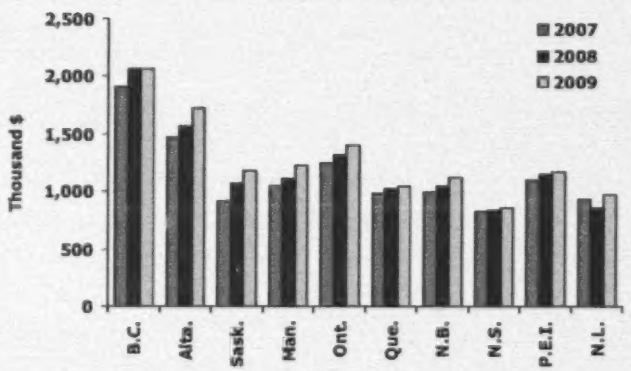
Source: Statistics Canada, Farm Financial Survey, 1995 to 2009 and AAFC calculations.
Note: Includes farms with $10,000 or more in gross revenues.

- **Average net worth increased in all provinces in 2009.**

  Average net worth per farm was up sharply in Ontario and the Prairie Provinces, while it remained relatively stable in British Columbia, Quebec and the Atlantic Provinces.

  Newfoundland and Labrador reported the largest percentage increase in net worth, partially due to a poor showing in 2008.

Chart C4.32
Average Farm Total Net Worth by Province
2007-2009



Source: Statistics Canada, Farm Financial Survey, 2007 to 2009 and AAFC calculations.
Note: Includes farms with $10,000 or more in gross revenues.

Some farm types have higher net worth because they tend to have greater assets

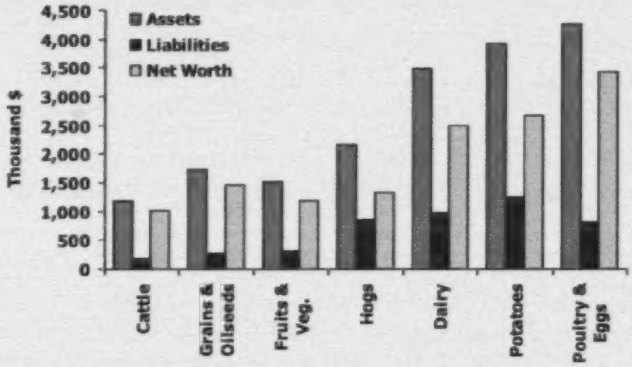
- **Poultry and egg farms reported the highest average net worth per farm, at over $3.4 million in 2009, followed by potato farms at $2.6 million and dairy farms at $2.5 million.**

  This reflects the fact that dairy, poultry and egg farms require quotas to operate their farms, which are included as assets. Similarly, potato farms require expensive, specialized machinery.

  Average assets and liabilities were significantly lower for cattle, hog, grain and oilseed and fruit and vegetable farms.

  Cattle farms reported the lowest average assets, liabilities and net worth of all farms.

Chart C4.33
Average Assets, Liabilities and Net Worth by Farm Type
2009



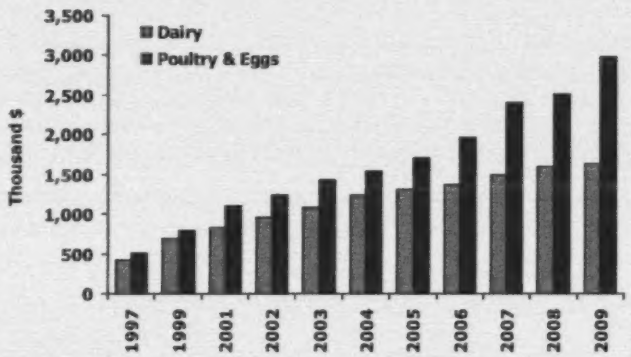
Source: Statistics Canada, Farm Financial Survey, 2009 and AAFC calculations.
Note: Includes farms with $10,000 or more in gross revenues.

- **Quota values for poultry and egg farms rose quickly over the last few years.**

  In 2009, dairy farms reported holding $1.6 million worth of quota, on average, while poultry farms reported average quota values of around $3 million. Dairy and poultry quotas accounted for approximately 46% and 53% of total farm assets, respectively. Quotas are required to produce milk, poultry and eggs in Canada.

  Dairy quotas have increased by less than poultry and egg quotas over the period 1997 to 2009. In January 2010, caps were placed on dairy quota values.

Chart C4.34
Average Quota Value of Supply-Managed Farms
1997-2009



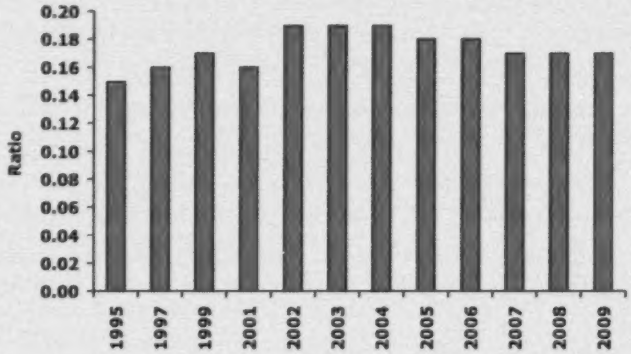
Source: Statistics Canada, Farm Financial Survey, 1997 to 2009 and AAFC calculations.
Note: Includes farms with $10,000 or more in gross revenues.

The debt to asset ratio reflects, to some degree, the farm's financial risk and how much of the farm's assets have been financed by debt

- **Over the past few years, debt to asset ratios have remained relatively stable and below the high levels reported in 2002-2004.**

  Interest rates are at historically-low levels, helping keep debt-servicing costs down.

Chart C4.35
Debt to Asset Ratios* for All Farms
1995-2009

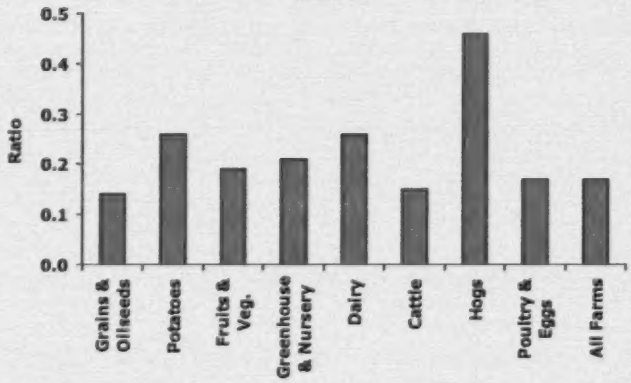


Source: Statistics Canada, Farm Financial Survey, 1995 to 2009 and AAFC calculations.
Note: Includes farms with $10,000 or more in gross revenues.
*Average per farm.

- **Debt to asset ratios also vary by farm type.**

  In 2009, grain and oilseed operations reported the lowest debt to asset ratios (14%) among all farm types, while hog farms reported the highest (46%). This reflects the significant debt these latter farms accumulated during the expansionary period for hog operations since the early 2000s.

Chart C4.36
Debt to Asset Ratios by Farm Type
2009



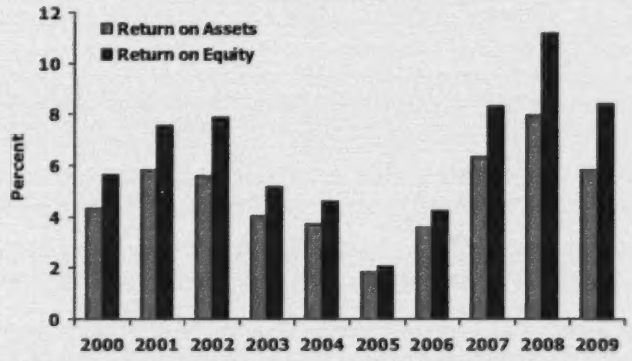
Source: Statistics Canada, Farm Financial Survey, 2009.

Rates of return to assets and equity also reflect the financial performance of farms, which vary according to farm type and market conditions

- **In Canada, the rates of return to both equity and assets for the grain and oilseed sector fluctuated significantly from one year to the next during the 2000 to 2009 period, and fell in 2009 after grain and oilseed prices peaked in 2008.**

  In 2009, the rates of return for grain and oilseed farms declined from the peak 2008 level. The return on equity averaged 8.4%, while the return on assets averaged 5.8% in 2009.

Chart C4.37
Rates of Return for Incorporated Grain and Oilseed Farms with Revenues of $250,000 to $500,000 2000-2009

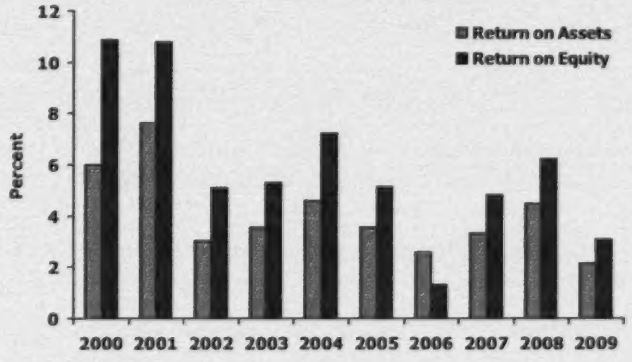


Source: Statistics Canada, Corporate Taxfiler Database, various years.

- **The hog sector has also experienced significant fluctuations in returns over time.**

  In 2009, the rates of return for incorporated hog farms declined significantly from 2008. They reported a substantial decline in both rates of return on assets and on equity, to 2.13% and 3.05%, respectively, down from 4% and 6% in 2008. These rates are the second lowest in over a decade.

Chart C4.38
Rates of Return for Incorporated Hog Farms with Revenues of $250,000 to $500,000 2000-2009



Source: Statistics Canada, Corporate Taxfiler Database, various years.

SECTION C5

Inputs to Primary Agriculture

INTRODUCTION:

Input and service suppliers, ranging from multinational firms and commodity brokers to small local agri-businesses, play a major role in the Canadian agriculture and agri-food system. Higher energy prices and increasing demand for agricultural commodities have contributed to rising input prices globally with significant implications for operating expenses. In order to reduce operating expenses, many producers purchase inputs through co-operatives during off-season periods or are adopting increasingly more energy-efficient practices.

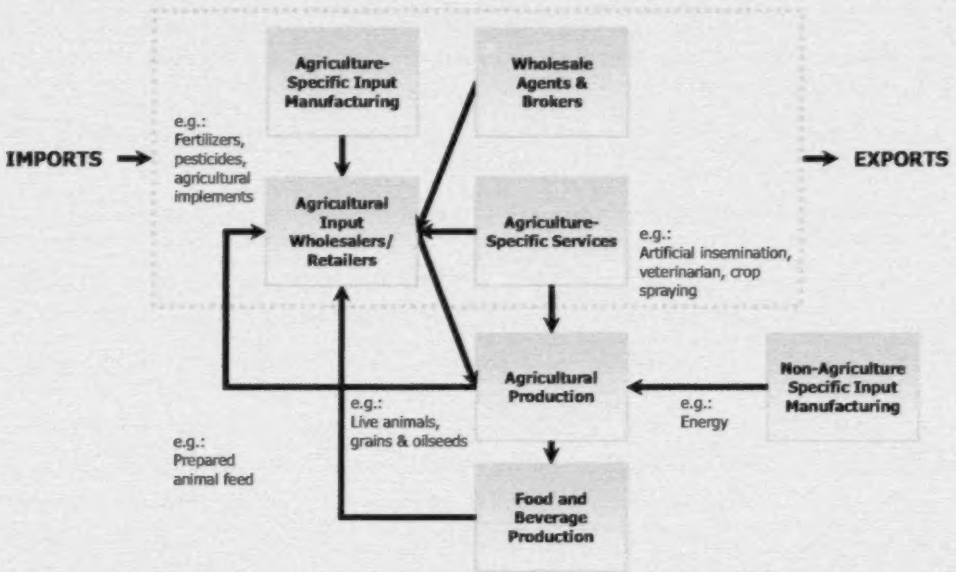
Input suppliers are a whole chain unto themselves

- **Agriculture-specific input and service suppliers constitute a whole value chain within the agriculture and agri-food system. They include input manufacturers, service providers, and retailers/wholesalers.**

  They supply and support primary agriculture and, at the same time, act as buyers of products from downstream industries (e.g. prepared animal feed from grain and oilseed mills or feeder calves from cow-calf operations).

  Agriculture-specific input and service suppliers are heterogeneous. They range from multinational firms producing agricultural machinery and implements, to small local businesses selling feed and pesticides, and from international commodity brokers to the next-door neighbour doing custom work.

Chart C5.1
The Value Chain of Agriculture-Specific Input and Service Suppliers



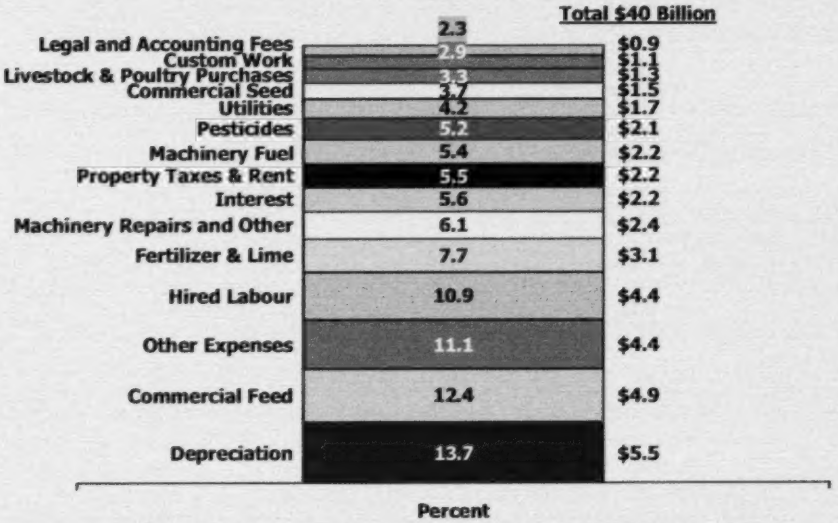
Source: AAFC.

As farms become more capital intensive, depreciation continues to be an important expense item

- **In 2010, farm net operating expenses and depreciation totalled $40 billion, which represents a decrease of 3.65% over 2009.**

  Depreciation was the largest individual expense for agriculture producers in 2010, followed by commercial feed ($4.9 billion), other expenses ($4.4 billion), hired labour ($4.4 billion) and fertilizer and lime ($3.1 billion).

Chart C5.2
Farm Net Operating Expenses and Depreciation
2010


Total $40 Billion
Legal and Accounting Fees 2.3 $0.9
Custom Work 2.9 $1.1
Livestock & Poultry Purchases 3.3 $1.3
Commercial Seed 3.7 $1.5
Utilities 4.2 $1.7
Pesticides 5.2 $2.1
Machinery Fuel 5.4 $2.2
Property Taxes & Rent 5.5 $2.2
Interest 5.6 $2.2
Machinery Repairs and Other 6.1 $2.4
Fertilizer & Lime 7.7 $3.1
Hired Labour 10.9 $4.4
Other Expenses 11.1 $4.4
Commercial Feed 12.4 $4.9
Depreciation 13.7 $5.5
Percent

Source: Statistics Canada.

Note: Other Expenses is the sum of smaller-value categories including: Repairs to Buildings and Fences, Irrigation, Twine, Wire and Containers, Crop and Hail Insurance, Artificial Insemination and Veterinary Fees, Business Insurance, and Stabilization Premiums.

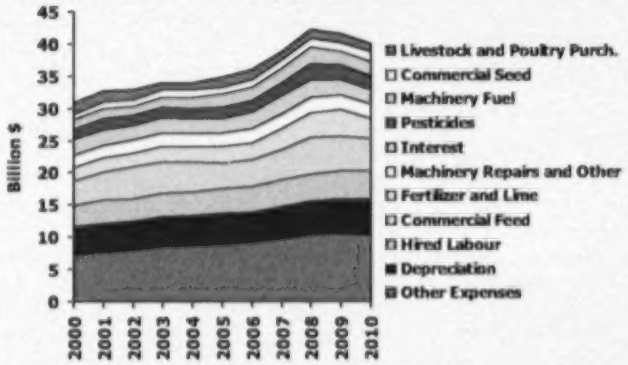
Operating expenses fell in 2010 as farm input prices were down from their peak in 2008

- **Producers saw their overall operating costs increase by 30% from 2000 to 2010.**

  The largest increase in expenses was in commercial seed, which increased by 65% between 2000 and 2010, followed by fertilizer and lime expenses, which increased by 50% over the same period.

  Livestock and poultry purchases decreased by 22% over the period, as well as interest expenses, which decreased by 10% from 2000 to 2010.

Chart C5.3
Farm Net Operating Expenses and Depreciation
2000-2010



Source: Statistics Canada.

Notes: Other expenses are the sum of the smaller-value categories including: Repairs to Buildings and Fences, Irrigation, Twine, Wire and Container, Crop and Hail Insurance, Artificial Insemination and Veterinary Fees, Business Insurance, and Stabilization Premiums.

- **Prices of inputs for crop production have grown at a faster rate than for animal production, driving up the overall farm input price index.**

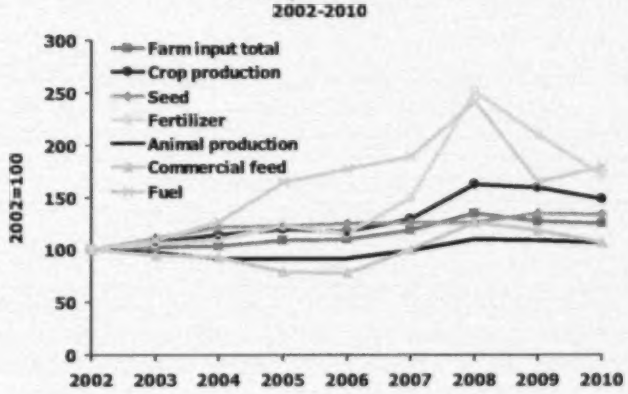
  Greater reliance on energy-linked inputs such as machinery fuel and fertilizer has been the main reason for the faster growth in the price of crop production inputs.

  After a significant spike in fertilizer prices in 2008, prices declined in 2009 and again in 2010, to reach pre-2008 levels.

  Higher commodity prices for grains and oilseeds drove up commercial feed prices for livestock producers in 2008, but feed prices have since declined through 2009 and 2010.

  Animal production is generally less vulnerable than crop production to energy-linked inputs such as fuel, resulting in more stable input price changes over the past two years.

Chart C5.4
Farm Input Price Index
2002-2010



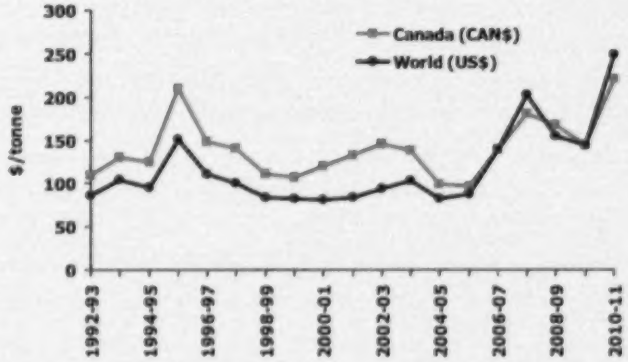
Source: Statistics Canada.

In the latter half of 2010, Canadian and world feed grain prices rebounded sharply raising feed costs for livestock producers while, at the same time, feeder cattle prices also rebounded

- **In the 2010-11 crop year, world feed grain prices increased significantly reaching record levels due mainly to strong world demand and lower production and stocks resulting from unfavourable climatic events.**

  In Canada, feed grain prices also increased significantly, but to a lesser extent than in world markets, as a stronger Canadian dollar helped to offset these price increases.

Chart C5.5
Canadian and World Feed Grain Prices
1992-93 to 2010-11



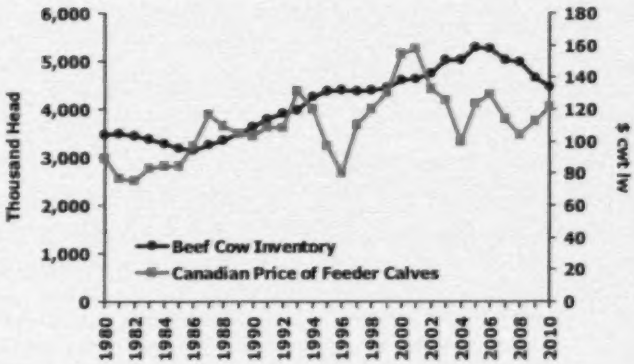
Source: University of Guelph, Ridgetown College and Chicago Board of Trade.
Note: Cumulative average for 2010-11 crop year.

- **The price of feeder cattle is partly determined by the profitability of cattle production and the level of beef cow inventories.**

  Since 2000, the price of feeder calves has tumbled. This was the result of BSE in 2003 and higher inventories resulting from the difficulties in exporting live animals south of the border at that time and after the introduction of COOL in the U.S. in 2008.

  In 2005, the post-BSE resumption of trade in young cattle under 30 months of age, including beef heifers, began to ease the inventory build-up. Lower prices of feeder cattle also dampened the strong herd growth seen in the past. The drought and world economic recession in 2009 extended the period of herd liquidation and consequently led to weak prices, which have only recently moved up again.

Chart C5.6
Canadian Feeder Calf Prices and Beef Cow Inventories
1980-2010



Source: Statistics Canada, Canfax and AAFC calculations.

Fertilizer prices, which peaked in 2008, have fallen to more normal levels in 2010

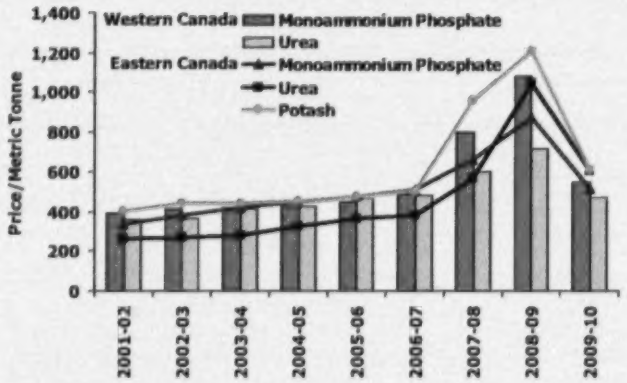
- **The fall in energy prices in 2009 and 2010 was responsible for lower fertilizer prices.**

  Prices for urea and monoammonium phosphate in both eastern and western Canada declined significantly in 2009-10 and remained well below the price peak of 2007-08.

  However, in 2009-10 potash prices in eastern Canada were still well above price levels observed before the price spike began in 2006-07.

  Western Canada is the primary producer, consumer and exporter of fertilizer in the country. In eastern Canada, however, the spike in fertilizer prices was sharper and prices did not drop back down as far in 2010.

Chart C5.7
Fertilizer Prices by Region
by Fertilizer Year (July to June)
2001-02 to 2009-10



Source: Farm Input Price Survey, AAFC and Alberta Input Monitoring System (AIMS).

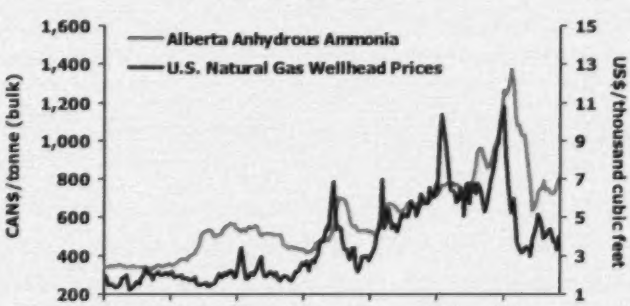
- **Fertilizer prices are primarily determined by supply and demand conditions as well as energy costs.**

  In 2010, the price of anhydrous ammonia in Alberta remained stable following large price declines in the second half of 2009.

  Nitrogen fertilizer prices generally closely follow natural gas prices. This is because natural gas is a major component of fertilizer production and makes up a significant part of its input costs.

  Natural gas prices experienced greater fluctuations than did anhydrous ammonia prices in 2010, although they still remained above the low values seen in September of 2009.

Chart C5.8
Anhydrous Ammonia and Natural Gas Prices
1991-2010



Source: Alberta Agricultural Input Monitoring System (AIMS) and the United States Energy Information Administration.

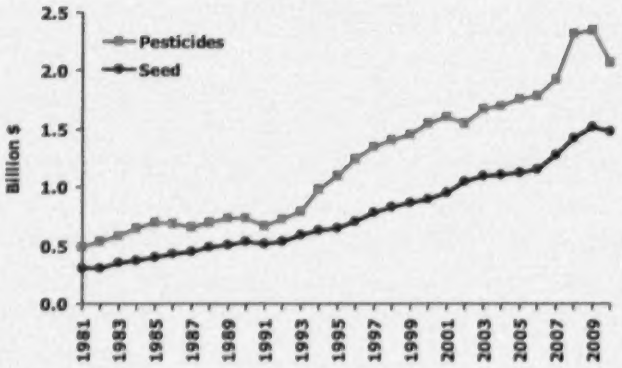
After several years of increases, pesticide and seed costs declined in 2010

- **Much of this decline was due to lower use of pesticides and lower planting due to wet conditions across much of Manitoba and Saskatchewan throughout 2010.**

  Seed and pesticide expenses in Canada have grown to over $3 billion annually in 2010.

  The upward trend in expenses on pesticides increased in the early and mid-1990s with increased use of plant fungicides to combat plant diseases such as Fusarium head blight in wheat.

Chart C5.9
Farm Expenses on Pesticides and Seed
1981-2010



Source: Statistics Canada.

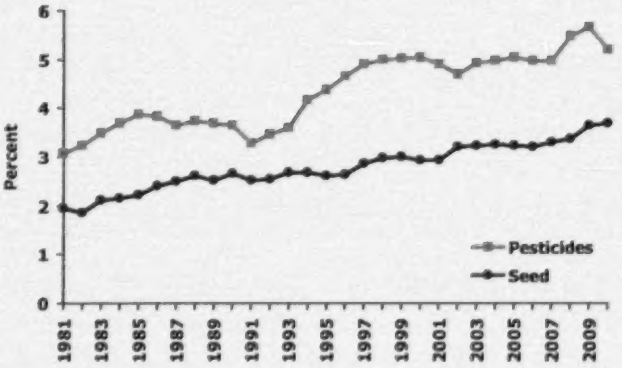
- **The result has been an increase in the share of total farm expenses accounted for by pesticides and seed, from 5% of expenses in 1981 to nearly 9% of the total by 2010.**

  Significant increases in R&D on new pesticides in the 1970s and the 1980s led to new, higher value pesticides such as fungicides (plant disease-targeting chemicals), which have driven up the overall price of pesticides.

  New production practices related to the use of conservation tillage practices, less summer-fallow and shorter crop rotations resulted in higher disease pressures and increased use of fungicides for disease control.

  The increased proliferation of genetically modified traits in major crops such as canola, corn, and soybeans has led to increased expenses on seed as major seed companies package the value of the trait in the cost of the seed, driving up overall seed expenses in recent years.

Chart C5.10
Share of Total Expenses Spent on Pesticides and Seed
1981-2010

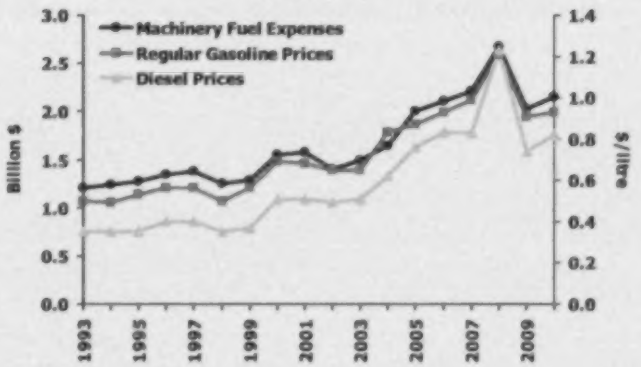


Source: Statistics Canada and AAFC calculations.

Fuel costs are also an important input expense for primary producers

- **Machinery fuel expenses, which track regular gasoline and diesel prices, increased slightly in 2010 following significant declines in 2009. However, prices still remain below the peak values of 2008 but above those of the 1990s.**

Chart C5.11
Farm Fuel Prices and Expenses
1993-2010



Source: Statistics Canada.
Note: Regular gasoline and diesel prices are from Ontario.

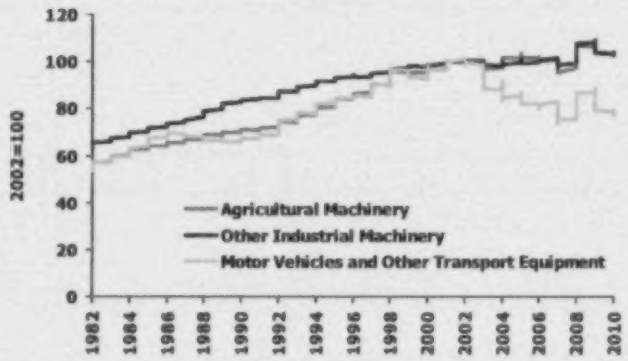
- **Purchases of agricultural machinery represent an important and significant expense for farmers.**

  Machinery and equipment purchases are capital expenses that may not be made every year on every farm. They do, however, represent a sizable portion of expenses for farmers, and lead to other expenses and costs such as repairs and depreciation.

  After relatively flat growth in prices from 2000 through 2008, agricultural machinery prices have increased by about 4% since mid-2008. Prices in 2009 spiked but fell back during 2010.

  Prices of other industrial machinery have tracked agricultural machinery very closely. Motor vehicles and other transport equipment prices have been declining throughout much of the past decade, with 2010 prices being nearly 25% below the 2002 price levels. This suggests that the factors driving motor vehicle prices down, such as higher fuel prices and the demand for smaller, more fuel-efficient vehicles are not as important for determining agricultural machinery prices.

Chart C5.12
Industrial Product Price Index for
Agriculture, Other Industrial Machinery and Motor Vehicles
1982-2010



Source: Statistics Canada.

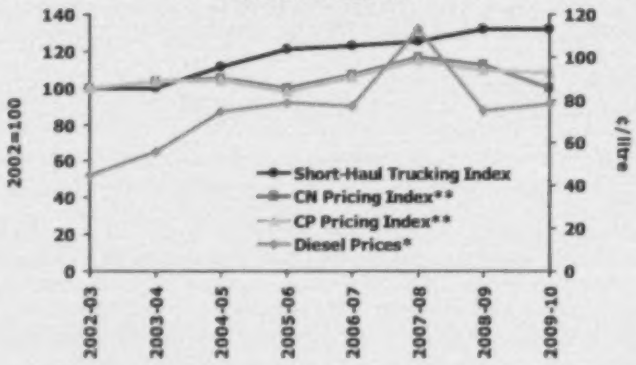
The prices farmers receive for their products are adjusted by the cost of transporting those products to market

- **The cost of shipping grain in western Canada has increased in recent years with short-haul trucking rates leading the way.**

  Short-haul trucking rates have increased in recent years, driven up by higher fuel prices. At the same time, however, high grain volume demands from 2008 to 2010 outpaced declines in fuel costs, keeping trucking rates stable over this period.

  Rail rates, which are indirectly affected by the rail revenue cap administered by Transport Canada, have not increased at the same rate as the less regulated trucking rates.

Chart C5.13
Rail and Trucking Rate Index
Western Canada
2002-03 to 2009-10



Source: Quorum Corporation, Various Grain Companies, and the Farm Input Price Survey, AAFC.

Note: * Diesel prices are from Manitoba.
**CN Pricing represents the rates charged by Canadian National (CN) railway while CP Pricing is that charged by Canadian Pacific (CP) railway.

NOTE(S):

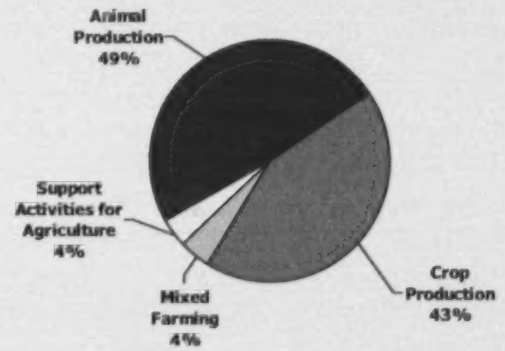
Consolidation in the grain handling industry that began in the mid-1990s with the elimination of the *Western Grain Transportation Act* subsidy resulted in a significant decline in the number of grain elevators across western Canada. Rail companies also responded by abandoning or selling portions of their track, leaving longer distances for farmers to deliver their grain. This consolidation across the grain handling and transportation sectors spawned a short-haul trucking industry to fill in the distance and service gaps with fewer elevators and less rail track.

Farmers make use of both hired and farm family labour as inputs into farming, but their importance varies by sector

- **In 2010, over 300,000 people were employed in primary agriculture, making up almost 2% of the total Canadian labour force.**

  Employment in animal production accounted for the largest share of primary agriculture employment, making up about 49% of the total, followed closely by crop production at 43%.

Chart C5.14
Distribution of Primary Agriculture Employment by Sector
2010

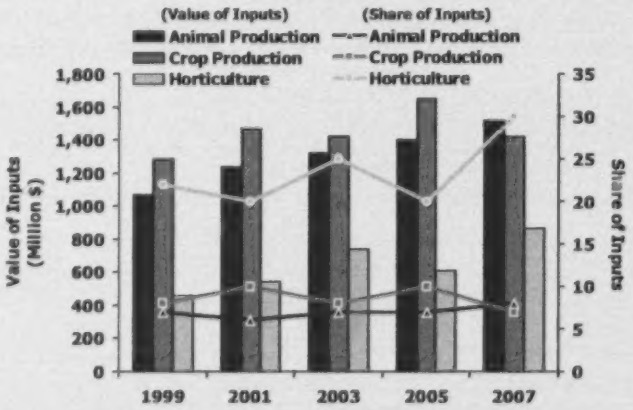


Source: Statistics Canada, Labour Force Survey and AAFC calculations.

- **From 1999-2007, nominal wages have generally increased across all three primary agriculture sub-sectors, animal and crop production and horticulture. However, the horticulture sector has the highest share of wage inputs and has experienced the largest nominal wage input increases over this period.**

  By 2007, wage inputs had grown to 30% of total inputs for the horticulture industry making it the single most important input cost for the horticulture industry.

Chart C5.15
Wage and Salary Inputs in Primary Agriculture
Value and Share of Total Inputs
1999-2007



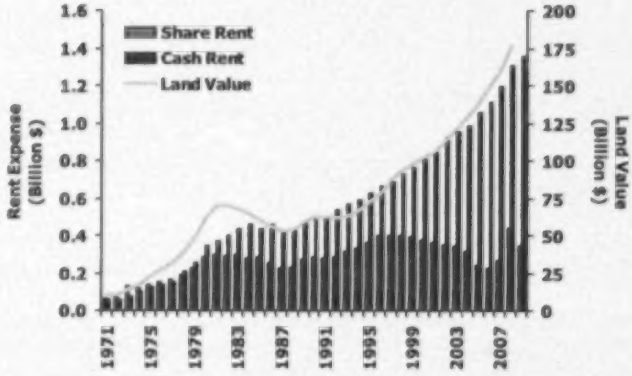
Source: Statistics Canada, Input/Output Tables and AAFC calculations.

Farmland values and rents have increased considerably over the past four decades

- **While land values remained relatively flat through much of the 1980s, they rose considerably through the 1990s and into the 2000s.**

  While cash rent and land values have trended upward together, the value of share rent has experienced a relative decline as landowners moved increasingly towards more cash rent arrangements in the past couple of decades. This movement partially reflects the lower-risk nature of cash rent over share rent.

Chart C5.16
Total Rent and Farmland Value
1971-2009



Source: Statistics Canada and AAFC calculations.

NOTE(S):

Landowners have traditionally relied on cash or share rent arrangements when renting their land to agricultural producers. Cash rent usually involves an agreed arrangement between the landowner and the renter, often set for a multi-year period. In this agreement, the producer is usually required to ensure proper stewardship of the land by controlling for pests. However, the same rate is paid regardless of what the output of the land is.

Share rent, or share cropping, involves an arrangement between the landowner and the renter wherein they share in the inputs and outputs of the land. The percentage to be shared is agreed upon between the two parties. The rent paid depends on production decisions made by the two parties and the output of the crop produced on the land. Therefore, the landowner in a share-crop situation assumes more downside risk in years where production is down, but has the opportunity for a greater rent value in years where production is above average.

SECTION C6

Natural Resource Use and Environmental Impacts

INTRODUCTION:

Agricultural production is dependent on the availability and quality of natural resources, such as soil, land, biodiversity and water. Agricultural production also has an impact on these natural resources, and this impact is determined by cropping choices, farming practices and input use decisions made by the farmer as well as by market conditions. While most farmers have always prided themselves on being good stewards of the land, increasingly they are being encouraged by both government policies and consumer demands to produce even more environmentally-friendly products that reduce their environmental footprint and further ensure the future sustainability of the sector.

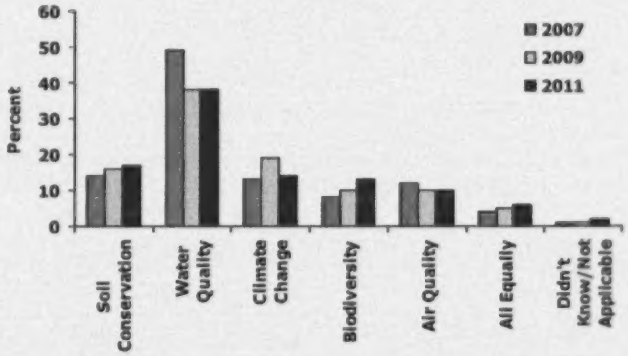
Canadian consumers are increasingly aware of the impact of agriculture on the environment

- **According to a recent 2011 public opinion survey, when asked to identify their environmental priorities for agriculture, 38% of Canadians reported water quality and 17% reported soil conservation.**

  Next in importance were climate change (14%), biodiversity (12%) and air quality (10%).

  Over the last five years, water quality, air quality and climate change have fallen in importance, whereas soil conservation and biodiversity have increased as reported by the general population.

Chart C6.1
Environmental Priorities
Reported by the General Population for Agriculture
2007, 2009 and 2011



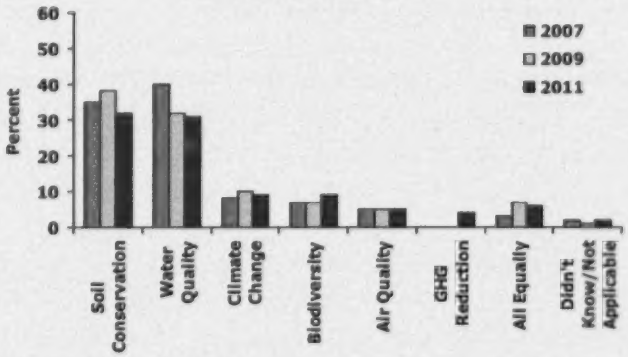
Source: AAFC, Strategic Issues Tracking Survey, 2011.

- **The environmental priorities identified by agricultural producers, who responded to the same survey, were in line with those of the general public. The main difference was that more producers identified soil conservation as an environmental priority.**

  Thirty-two percent of producers considered soil conservation as a priority for agriculture. This is down slightly from 2007. A slightly smaller percentage of producers (31%) considered water quality a priority, compared to the general population (38%).

  Next in importance for agricultural producers were climate change and biodiversity. Air quality and greenhouse gas (GHG) reduction were least important, with less than 5% of producers identifying these issues as environmental priorities in 2011.

Chart C6.2
Environmental Priorities
Reported by Producers for Agriculture
2007, 2009 and 2011



Source: AAFC, Strategic Issues Tracking Survey, 2011.

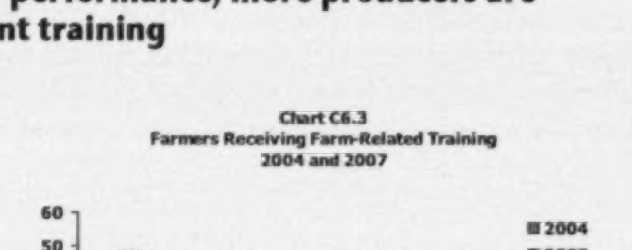
To better understand the impact they can have on the environment, and what they can do to improve their performance, more producers are taking environmental management training

- **In 2007, 69% of agricultural producers reported taking some type of farm-related training in the previous five years. This was up substantially from the 59% of producers that reported taking part in similar training in 2004.**

  The three most popular types of farm-related training taken by farmers in 2007 were training in environmental management (48%), agricultural production (39%) and food safety and quality (26%).

  Between 2004 and 2007, there was an increase in participation by farmers in all types of farm-related training. However, the largest increase was for training in environmental management at 48% of respondents in 2007 compared to 31% in 2004.

Chart C6.3
Farmers Receiving Farm-Related Training
2004 and 2007



Source: AAFC, Renewal Survey, 2004 and 2007.

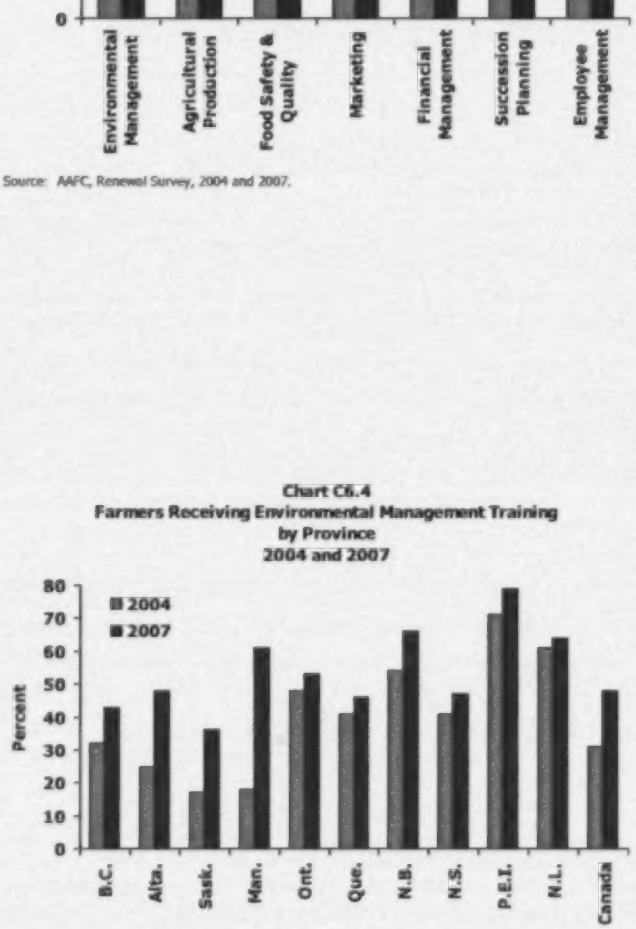
- **In 2007, participation in environmental management training increased in all provinces since 2004, to over 48% of respondents.**

  Seventy-nine percent of producers residing in Prince Edward Island reported having received training in environmental management in the previous five years, followed by 66% of producers in Newfoundland and Labrador.

  Only one-third of producers in Saskatchewan (36%) reported training in the five years prior to the 2007 survey.

  Manitoba was the province with the largest increase in the percentage of farmers reporting training in environmental management, at 61% of respondents in 2007, up substantially from 18% in 2004. A large increase in the percentage of farmers reporting having received this training occurred in Alberta as well, where this share rose to 48%, up from 25% in 2004. In Saskatchewan, this percentage rose to 36% from 17% over the same period.

Chart C6.4
Farmers Receiving Environmental Management Training
by Province
2004 and 2007



Source: AAFC, Renewal Survey, 2004 and 2007.

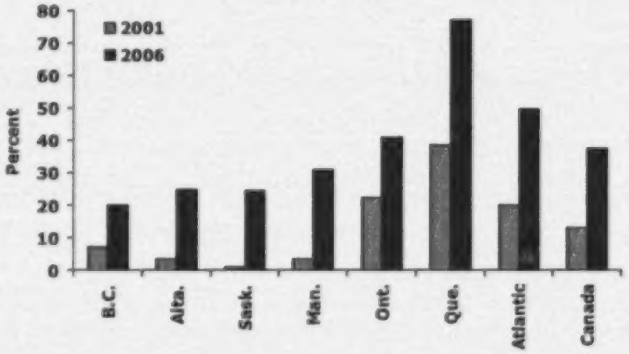
Environmental Farm Plans (EFPs) have become an important management tool for farmers, leading to an increase in the adoption of Beneficial Management Practices (BMPs)

- **The introduction of a national EFP program under the Agricultural Policy Framework in 2004 has had a major positive impact, resulting in a significant increase in the development of EFPs by 2006.**

  The percent of farmers reporting having EFPs in Canada jumped from 13% in 2001 to 38% in 2006. While an average of only 2.7% of Prairie producers reported having an EFP in 2001, close to one out of four producers had one by 2006.

  The high rate of adoption of EFPs in the province of Quebec is due to multiple programs in place since the mid-1990s by le ministère de l'Agriculture, des Pêcheries et de l'Alimentation du Québec (MAPAQ) with the objectives of helping agricultural producers conform to certain environmental regulations and improve environmental practices.

Chart C6.5
Producers Reporting Having an EFP
by Region
2001 and 2006



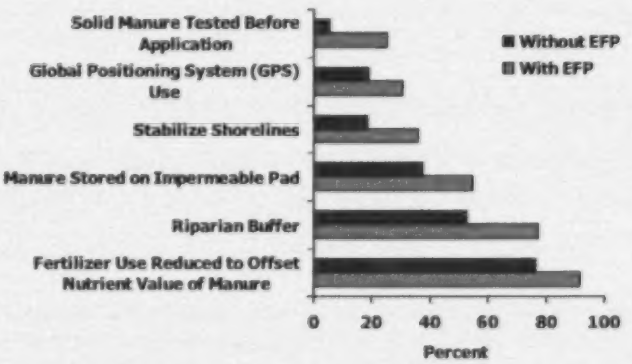
Source: Statistics Canada, Census of Agriculture, 2006 and AAFC Farm Environmental Management Survey, 2006.

- **The adoption of EFPs has been important for encouraging the adoption of environmentally-friendly practices, leading to a significant increase in the adoption of BMPs.**

  For instance, producers reporting having EFPs in 2006 were more likely to have adopted various BMPs. So for example, while 80% of producers with EFPs reported adopting riparian buffer zones around waterways, only 50% of producers without an EFP had done so.

  Although the adoption of EFPs has had a significantly positive impact on the adoption of BMPs, historical data indicates that the percent of producers without EFPs who adopted BMPs, also increased between 2001 and 2006. This indicates that producers are increasingly concerned about the impact their production practices are having on the environment and are striving to farm in an environmentally-friendly way with or without a formal EFP.

Chart C6.6
Producers Reporting the Adoption of BMPs
With and Without EFP
2006



Source: Statistics Canada, Census of Agriculture, 2006 and AAFC Farm Environmental Management Survey, 2006.

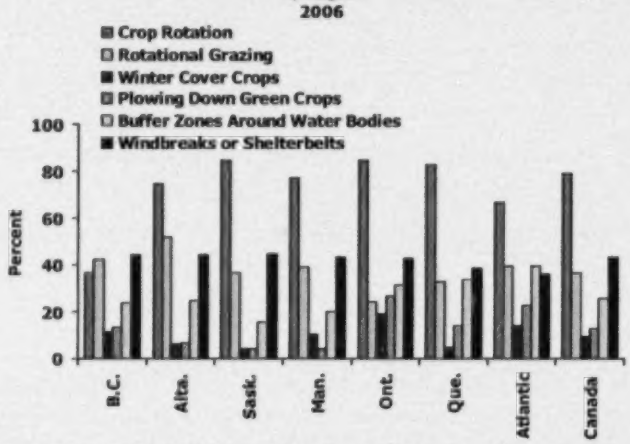
Soil conservation practices are important BMPs for protecting the soil, improving soil productivity and reducing GHG emissions

- **Most agricultural producers in Canada use crop rotation as a soil conservation practice.**

  Crop rotation, which involves changing the type of crop grown on the same land from one year to the next, helps producers control weeds, insects and disease, replenish soil nutrients and reduce soil erosion.

  According to the 2006 Census of Agriculture, crop rotation is used, on average, by more than 70% of agricultural producers in Canada. These practices vary, of course, by the type of crops grown in the province (i.e. potatoes or canola production require more crop rotation). Crop rotation is used by over 80% of producers in Saskatchewan, Ontario and Quebec. In Alberta, where there is significant livestock production, rotational grazing is used by 50% of producers. In British Columbia, only 40% of farmers used this practice. In British Columbia, rotational grazing and windbreaks or shelterbelts are the more prevalent soil conservation practices employed by farmers.

Chart C6.7
Producers Using Soil Conservation Practices
by Region
2006



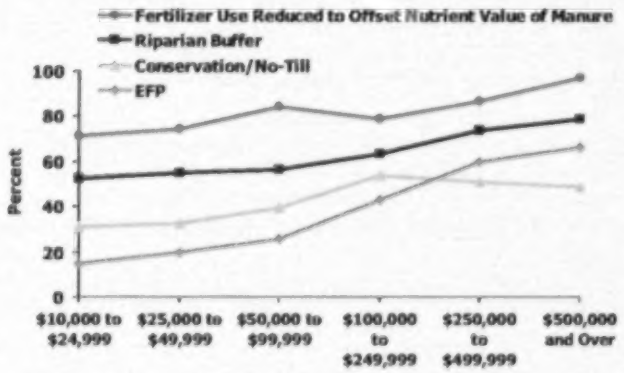
Source: Statistics Canada, Census of Agriculture, 2006.

Producers on large farms tend to use EFPs and BMPs more frequently than do those on smaller farms

- **However, this varies for different BMPs.**

  For instance, 50% of very large farms with revenues of $100,000 and over reported adopting conservation and no-till practices in 2006 compared to only 30% of small farms with revenues of $10,000 to $99,999. The adoption of riparian buffers along waterways was adopted by 55% of producers on farms with revenues between $10,000 and $99,999, compared to 79% of producers on farms with revenues of $500,000 and over. The reduction in fertilizer use to offset the nutrient content from manure is the BMP that is most often used by a high percentage of producers regardless of size; 70% of farms with revenues between $10,000 and $24,999, and 97% of farms with revenues of $500,000 and over reported using this BMP.

Chart C6.8
Rate of Adoption of BMPs
by Revenue Class
2006

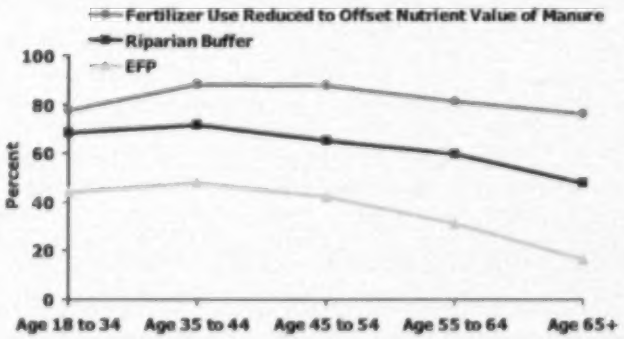


Source: Statistics Canada, Census of Agriculture, 2006, and AAFC Farm Environmental Management Survey, 2006.

- **By age of operator, BMP adoption rates were highest for farm operators in the 35 to 44 age group, and these rates decreased as operators aged.**

  Over 40% of young operators (in the 18 to 34 age group) developed EFPs, but this rate declined as producers got older to less than 20% of operators aged 65 and over. This suggests a greater hesitation to develop a formal EFP by older farmers compared to adopting other BMPs. Similarly, the adoption rate for operators adopting riparian buffers declined as operators got older, from 70% of young operators (in the 18 to 34 age group) to 40% of those aged 65 and over.

Chart C6.9
Rate of Adoption of BMPs
by Age of Operator
2006



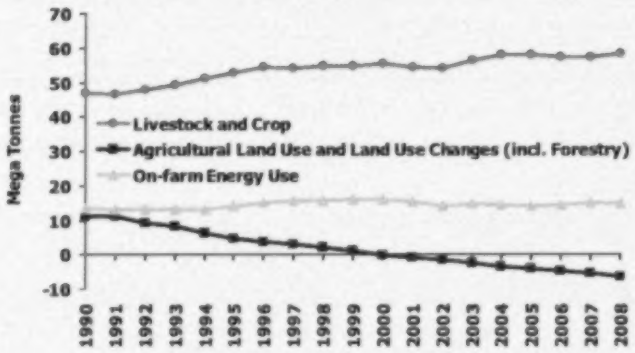
Source: Statistics Canada, Census of Agriculture, 2006, and AAFC Farm Environmental Management Survey, 2006.

GHG emissions from the agriculture sector have declined over time, the result of better land management practices

- **Over the 1990 to 2008 period, there were reductions in GHG emissions of 17 Mt, due to land use and land use changes (including forestry), which more than offset an increase of 12 Mt due to increased livestock and crop production. On-farm energy use was responsible for an increase in GHG emissions of 1 Mt.**

  The main drivers of the trend upwards in GHG emissions from livestock and crops were the expansion of the beef cattle and swine populations, and increases in the application of synthetic nitrogen fertilizers on the Prairies.

Chart C6.10
Sources of GHG Emissions in Agriculture
1990-2008

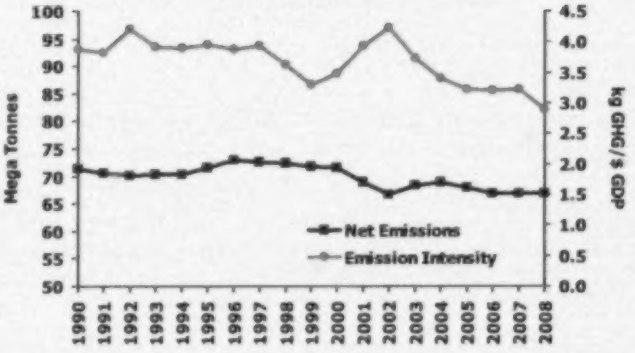


Source: Environment Canada, National Inventory Report and Natural Resources Canada, National Energy Database, 1990-2009.

- **Net GHG emissions from the agriculture sector declined by 6% (4 Mt) over the 1990-2008 period.**

  Emission intensity, which measures the GHGs emitted per unit of economic activity (i.e. GDP), decreased even more dramatically, by 26% over the same period. This was due to the 26% increase in GDP of the agricultural sector between 1990 and 2008.

Chart C6.11
Emissions and Emission Intensity
of the Agriculture Sector
1990-2008



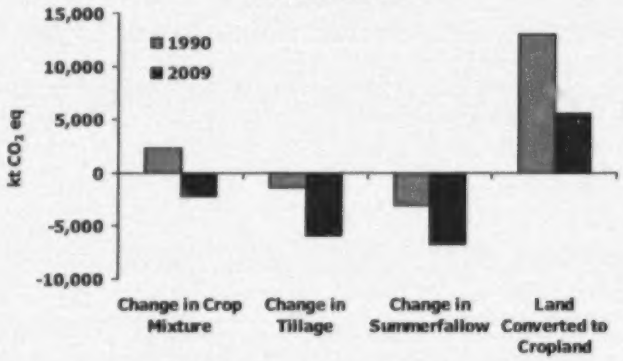
Source: Environment Canada, National Inventory Report and Natural Resources Canada, National Energy Database, 1990-2009.

Productivity gains and changes in management practices over time have resulted in a significant reduction in emissions per unit of agricultural production

- **Changes in crop mix, reduced summerfallow, increased use of conservation tillage practices and the decline in the ratio of land converted to cropland from forest explain the decline in net GHGs over time.**

  As a result of reduced area in summerfallow, GHG emissions declined by over 5 Mt CO_2 eq. Similarly, emissions declined by a similar amount due to a change in tillage practices, away from conventional tillage towards more no-till. The land converted to cropland category includes the conversion of forestland and grassland to cropland. GHG emissions from land being converted to cropland has declined but remained positive from 1990 to 2006. Converting forestland to cropland accounted for nearly 100% of the total emissions in this category.

Chart C6.12
Change in Emissions and Removals Associated with Land Management Changes 1990 and 2009



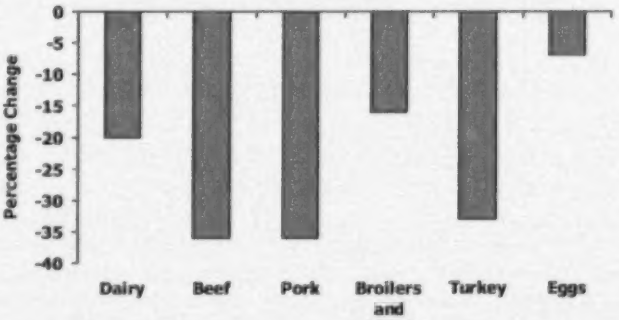
Source: Environment Canada, National Inventory Report.

- **Improved nutrient management, reduced energy consumption and changes in animal feeding practices and breeds have led to improvements in the efficiency of production, resulting in decreased GHG emissions per unit of output over the 1981 to 2006 period.**

  For example, in the dairy industry, an increase in milk production per cow allowed for a reduction in the dairy cow herd while keeping total milk production steady, and this led to a reduction of 20% in GHG emissions per kg of milk produced.

  GHG emissions per unit of production for beef and pork both decreased by 36% between 1981 and 2006.

Chart C6.13
Percentage Change in GHG Emissions per Unit of Production 1981-2006



Source: AAFC, Environmental Sustainability of Canadian Agriculture: AGRI-ENVIRONMENTAL INDICATOR REPORT SERIES, Report #3, 2010 and Vergé, X.P.C., Dyer, J.A., Desjardins, R.L., and Worth, D.E., 2009.

Note: For pork and beef, the series was terminated in 2001.
Difference in units of measure between commodities: kg CO_2e/ kg lw, kg milk or 12 eggs.

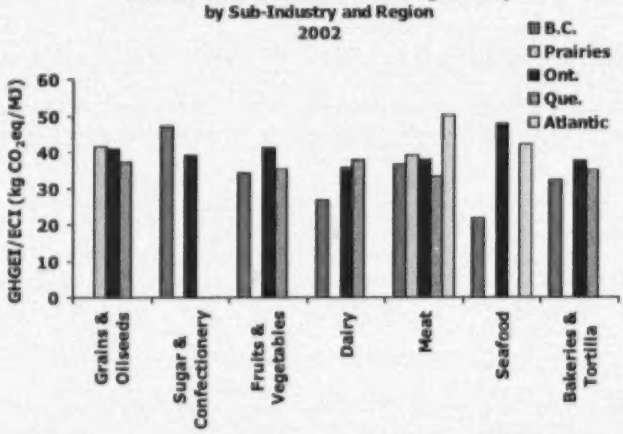
GHG emission intensity in the food processing industry varies by province and sub-industry

- **Emission intensities in the food processing sub-industries vary across regions depending on the source of energy used.**

  Differences between British Columbia and Ontario are mainly due to differences in the energy needs of the subsectors. A large component of British Columbia's food processing industry activity is in sugar manufacturing, which requires extensive fossil fuel (mostly natural gas) energy for processing that cannot be handled economically by electricity.

  Differences in the seafood sector by province are due to a cleaner energy grid used in British Columbia where there is more natural gas. The regional differences in the meat sector are attributable to the fact that the energy grid in the Atlantic Provinces and Alberta rely more on heavier fuel oils than do the energy grids in Quebec, Ontario and British Columbia, where hydro and natural gas are used.

Chart C6.14
GHG Emissions in the Food Processing Industry by Sub-Industry and Region 2002



Source: AAFC, Environmental Sustainability of Canadian Agriculture: AGRI-ENVIRONMENTAL INDICATOR REPORT SERIES, Report #3, 2010.

Note: GHGEI/ECI expresses the amount of GHG emitted for each MJ of energy consumed.

SECTION D

Government and the Agriculture and Agri-Food Sector

SECTION D1

Government Expenditures

INTRODUCTION:

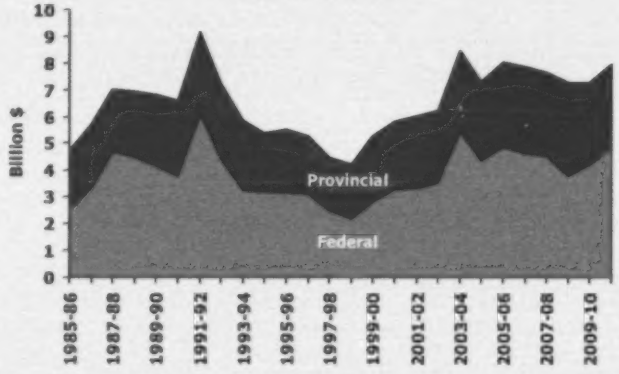
Government expenditures (federal and provincial) in support of the agriculture and agri-food sector are estimated to increase again in 2010-11. As a share of sector GDP, government expenditures are estimated to rise slightly to 33%, from levels in 2009-10. Program payments continue to make up the largest portion of government expenditures in support of the sector.

Government expenditures in support of the agriculture and agri-food sector continue to grow from levels in the late 1990s

- **Federal and provincial governments provide a significant level of support to the agriculture and agri-food sector in Canada, with the federal government contributing, on average, 59% of the total over the whole period.**

  Total government expenditures in support of the agriculture and agri-food sector are estimated to be $7.9 billion for the 2010-11 fiscal year. This is up by more than half a billion dollars from the previous year with both federal and provincial support levels increasing.

Chart D1.1
Total Government Expenditures in Support of the Agriculture and Agri-Food Sector 1985-86 to 2010-11

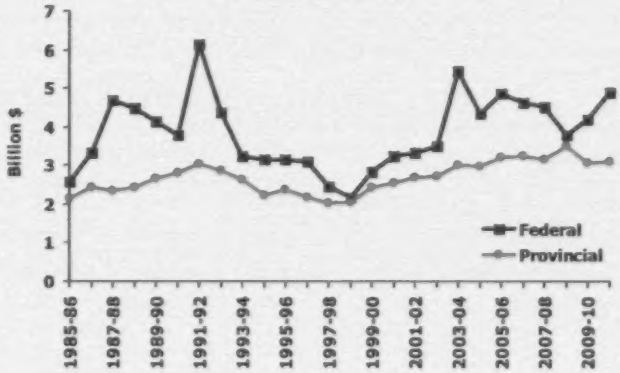


Source: AAFC.
Note: 2010-11 figures are estimates.

- **Both federal and provincial expenditures have increased over time, with federal expenditures much more variable in response to specific disasters such as the 2003 Bovine Spongiform Encephalopathy (BSE) crisis and recent flooding on the Prairies.**

  Federal government expenditures peaked in 1991-92 when new programs such as the Net Income Stabilization Account and the Gross Revenue Insurance Program were introduced. The federal government also provided additional support through ad hoc programs to help producers transition to this new set of programs. Expenditures peaked again in 2003-04 with the BSE crisis. Recently they have risen due to disasters such as flooding on the Prairies and programs to address disease and hardship in the hog industry.

Chart D1.2
Federal and Provincial Government Expenditures in Support of the Agriculture and Agri-Food Sector 1985-86 to 2010-11



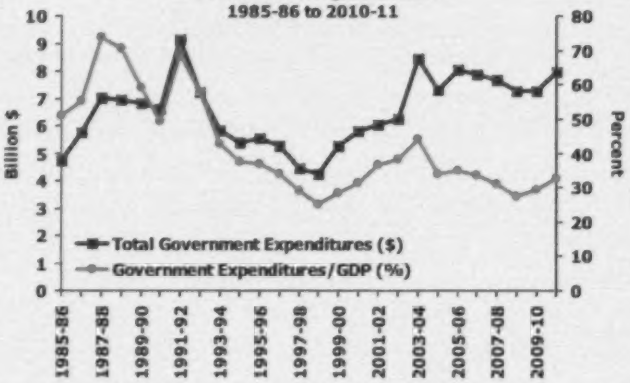
Source: AAFC.
Note: 2010-11 figures are estimates.

Government expenditures in support of the agriculture and agri-food sector also rose as a share of GDP in 2010-11

- **Compensation for 2010 flooding damage and a number of new programs aimed at aiding the livestock industry boosted program payments in 2010-11 to reach 33% of agriculture and agri-food GDP.**

  Throughout the 1990s, government expenditures declined, both in dollar terms and as a share of agriculture and agri-food GDP. However, since 1999-00, both indicators increased to peak in 2003-04. After this time, government expenditures were on a slightly declining trend both in dollar terms and as a share of GDP until this year, when they both increased again.

Chart D1.3
Total Government Expenditures
in Support of the Agriculture and Agri-Food Sector
and as a Share of Agriculture GDP
1985-86 to 2010-11



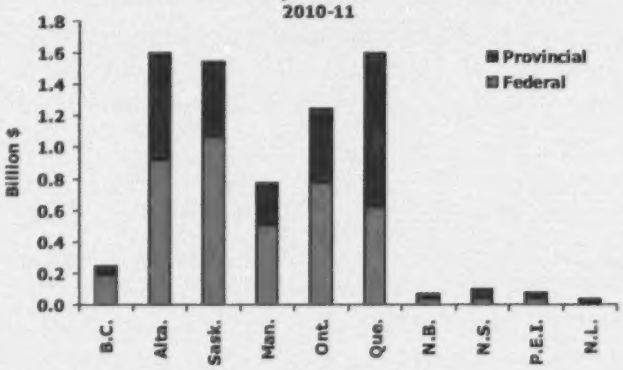
Source: AAFC.
Note: 2010-11 figures are estimates.

Government expenditures in support of the agriculture and agri-food sector vary by province since some provinces have unique programs to address regional needs

- **The federal government is expected to contribute more than half of total support in most of the provinces in the 2010-11 fiscal year.**

  However, provincial governments in Nova Scotia, Quebec, and Newfoundland and Labrador are expected to provide a larger share of total support since they have unique programs that address regional needs.

Chart D1.4
Total Government Expenditures in Support of the Agriculture and Agri-Food Sector by Province 2010-11

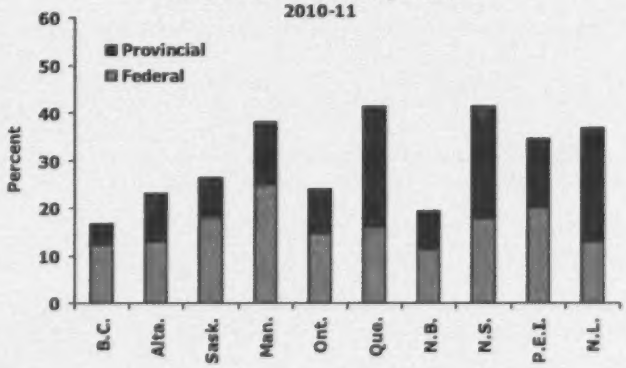


Source: AAFC.
Note: 2010-11 figures are estimates.

- **In 2010-11, total government expenditures in support of the agriculture and agri-food sector averaged 33.5% of agriculture and agri-food sector GDP at the national level, but this share varied across provinces.**

  Government expenditures to support the agriculture and agri-food sector, as a share of sector GDP, are expected to be higher than average in Prince Edward Island, Newfoundland and Labrador, Manitoba, Nova Scotia and Quebec, but lower than average in British Columbia, Alberta, Saskatchewan, Ontario and New Brunswick.

Chart D1.5
Total Government Expenditures in the Agriculture and Agri-Food Sector as a Share of Sector GDP by Province 2010-11



Source: AAFC.
Note: 2010-11 figures are estimates.

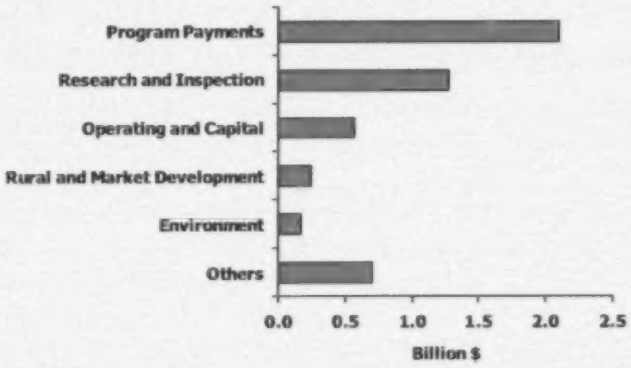
Program payments make up the largest portion of federal and provincial government support

- **In the 2010-11 fiscal year, program payments are estimated to account for the largest share of federal government expenditures in support of the agriculture and agri-food sector in Canada.**

  Program payments will account for 41% of total federal government expenditures to support the sector in the 2010-11 fiscal year.

  Research and inspection expenditures are the second most important category of government expenditures, estimated to account for 25% of the total in 2010-11.

Chart D1.6
Federal Government Expenditures in Support of the Agriculture and Agri-Food Sector by Major Category 2010-11

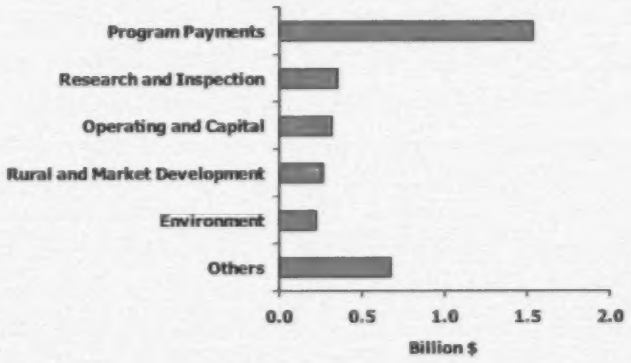


Source: AAFC.
Note: 2010-11 figures are estimates.

- **At the provincial level, program payments are also the most important government expenditure category in support of the agriculture and agri-food sector.**

  Program payments will account for 46% of total provincial government expenditures in support of the sector in the 2010-11 fiscal year. However, only 10% will be spent on research and inspection, compared to 25% at the federal level.

Chart D1.7
Provincial Government Expenditures in Support of the Agriculture and Agri-Food Sector by Major Category 2010-11



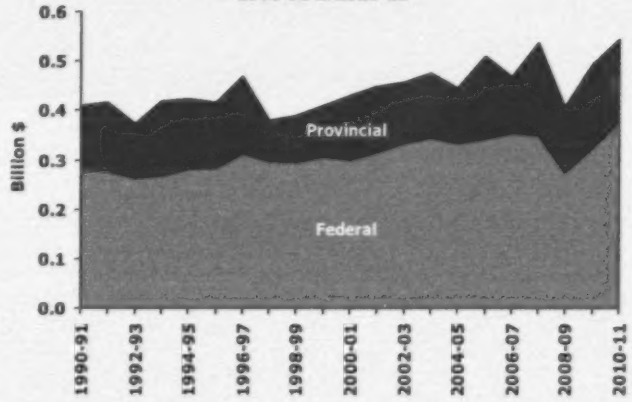
Source: AAFC.
Note: 2010-11 figures are estimates.

Public research expenditures in agriculture and agri-food are important investments for the future growth of the sector

- **There has been an increasing trend in total publicly-funded research expenditures in the agriculture and agri-food sector over the last decade, with a peak of $543 million expected in the 2010-11 fiscal year.**

  In Canada, publicly-funded research expenditures in agriculture and agri-food are predominantly provided by the federal government. On average, federal expenditures have accounted for 70% of total public research expenditures over the past ten years (2000-01 to 2010-11), with the provinces accounting for the remaining 30%. Over the past five years, a larger proportion of public R&D funding is being targeted to encourage partnership with industry and academia and more applied research results.

Chart D1.8
Government Research Expenditures in Agriculture and Agri-Food
1990-91 to 2010-11

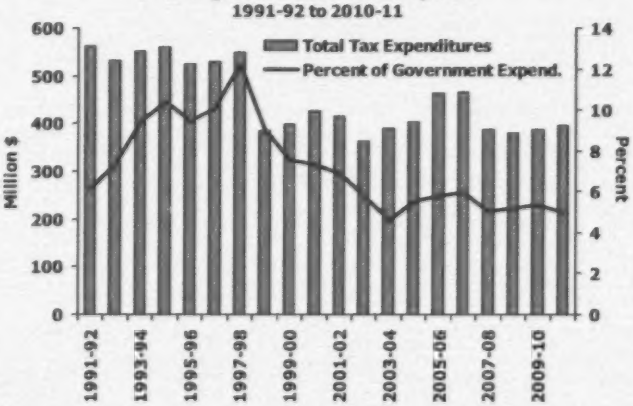


Source: AAFC.
Note: 2010-11 figures are estimates.

- **In addition to tax exemptions and rebates, foregone tax revenue (tax expenditures) is a source of government support to the agriculture and agri-food sector. From 1991-92 to 2010-11, tax expenditures averaged 6.9% of total government support and have been stable since 2007-08.**

  After a recent decrease, provincial tax exemptions and rebates associated with primary agriculture are expected to increase to almost $400 million in fiscal year 2010-11. Despite this increase, tax expenditures as a share of government expenditures have decreased slightly to below 5%.

Chart D1.9
Support to Farm Producers Through Tax Rebates and Exemptions
1991-92 to 2010-11



Source: AAFC.
Note: 2010-11 figures are estimates.

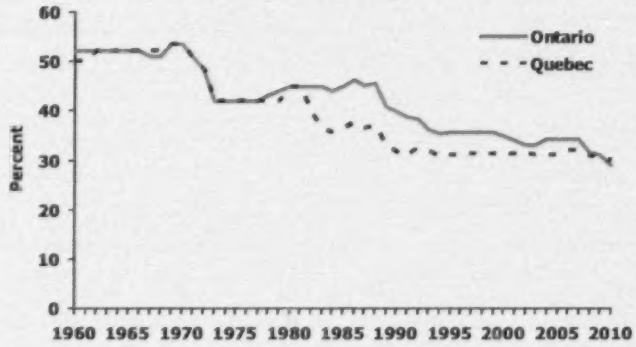
Governments also support the agriculture and agri-food sector through tax reductions and investment in public infrastructure

- **Combined federal and provincial income tax rates for corporations primarily engaged in processing have decreased in most provinces since the mid-1980s.**

  In Ontario and Quebec, which together account for two-thirds of Canadian food processing GDP, the combined rate for processing corporations has decreased substantially. In the mid-1980s the rate was 45% and 36%, respectively; this dropped to 29% and 30%, respectively in 2010.

  The combined rate for processing corporations decreased in both provinces between 2009 and 2010. For Ontario, this was due to a reduction both in the effective general federal tax rate (from 19% to 18%) and in the provincial corporate income tax rate for processors (from 12% to 10%). In Quebec, the change in the rate for processing corporations was entirely due to the federal tax reduction.

Chart D1.10
Combined Federal/Provincial Corporate Income Tax Rates for Processors, Ontario and Quebec 1960-2010

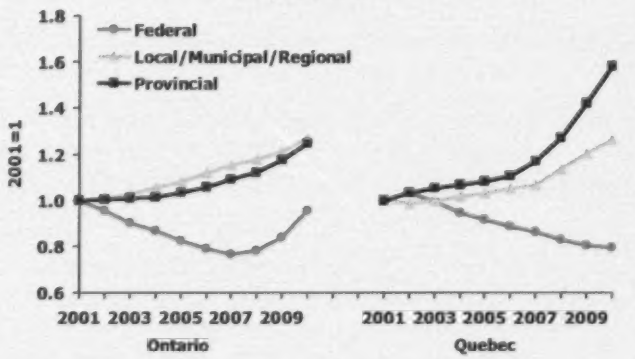


Source: AAFC, Corporate Income Tax Rate Database: Canada and the Provinces 1960-2005 (data revised September 2011).

- **Public engineering infrastructure services are an important input in the production and distribution of processed food. These stocks have changed at different rates over the past decade.**

  Federal engineering infrastructure stock declined in both Ontario and Quebec from 2001 up until 2007; in 2008-2010 the federal stock increased in Ontario but continued to decrease in Quebec. Growth in local/municipal/regional engineering infrastructure was similar in both provinces over the whole decade. Provincial engineering infrastructure growth was similar in both provinces up until 2007. From 2008 onwards, the provincial stock in Quebec grew considerably more rapidly than the stock in Ontario. Since the federal share of all public engineering infrastructure was low in both provinces, this means that, since 2007, services from public engineering infrastructure available to food processors may have increased in Quebec relative to Ontario.

Chart D1.11
Growth in Public Engineering Infrastructure Stocks in Ontario and Quebec, by Level of Government 2001-2010



Source: Statistics Canada.

Note: Engineering infrastructure includes transportation infrastructure (highways, roads, streets, bridges, rail track, port facilities, etc.) as well as other types such as waterworks, sewers, etc.

SECTION D2

Producer Support Estimate and Agricultural Policies in Other Countries

INTRODUCTION:

Agricultural policies in Canada and other countries have evolved over time. Changes have been made not only by decreasing the level of support, but also by modifying the type of support. Some countries have made significant reforms to their agricultural policies. The Organisation for Economic Co-operation and Development (OECD) indicators are used to present measures of these policy changes.

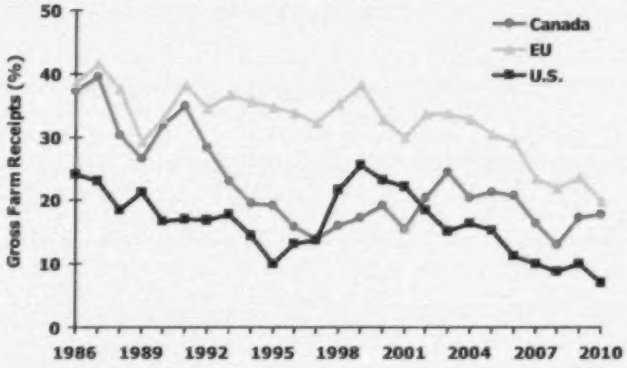
In recent years, support to Canadian producers as measured by the producer support estimate (PSE) has fallen, particularly budgetary transfers to producers. However, it has risen above that of the U.S., but still remains below that of the EU

- **In 2010, the PSE for Canada was 18% of gross farm receipts compared to 20% for the EU and 7% for the U.S.**

  Canadian support to producers increased slightly from 17% in 2009 to 18% in 2010 mainly due to a decrease in farm receipts and an increase in market price support (MPS). Canada still supports its producers more than the U.S. but just slightly less than the EU.

  The decrease in MPS in 2010 occurred as a result of a decrease in the value of production, a decrease in the world price of dairy products which is used as the reference price and an increase in the producer price.

Chart D2.1
PSE in Selected Countries
1986-2010



Source: OECD, Trade and Agriculture Directorate, Producer and Consumer Support Estimates, OECD Database.
Note: 2010 data is preliminary.

- **In 2010, 62% of total support to producers in Canada was provided through budgetary transfers to producers at 7% of gross farm receipts (GFR) and through MPS representing 11% GFR.**

  Since 1986, both MPS and budgetary transfers have decreased significantly. Budgetary transfers have decreased from 19% to 7% of GFR. MPS has decreased from 19% of GFR in 1986 to 11% in 2010.

  Milk has always been the commodity which receives the highest level of support through MPS in Canada. However, support to the grains sector through MPS was also important before the elimination of the Western Grain Transportation Act in 1995, after which time, support to producers has hovered between 6% and 11% of GFR.

Chart D2.2
Composition of Support to Producers in Canada
1986-2010

Source: OECD, Trade and Agriculture Directorate, Producer and Consumer Support Estimates, OECD Database.
Note: 2010 data is preliminary.

NOTE(S):

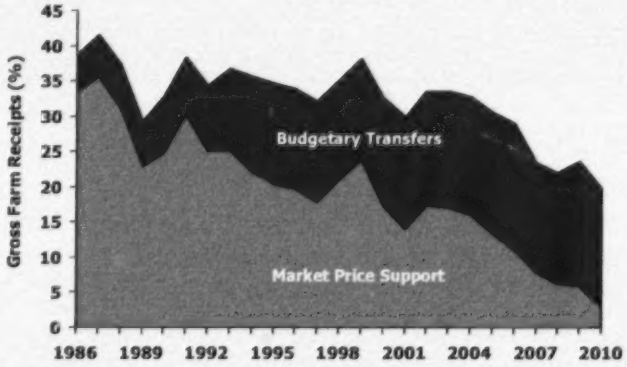
Producer Support Estimate (PSE) is an indicator of support that measures the level of support to producers which includes both budgetary support (i.e., types of government expenditures) and market price support (MPS) (i.e., border measures) that provide implicit support to producers.

In the EU and the U.S., policy reforms have led to a significant reduction in MPS and continued budgetary transfers to producers

- **In 2010, 17% of total support to producers in the EU(27) was provided through budgetary transfers while MPS represented 3% of GFR.**

  Since 1986, MPS, expressed as percent of GFR, has decreased significantly, while budgetary transfers have increased significantly. MPS has decreased from 33% of GFR in 1986 to 3% in 2010, while budgetary transfers have increased from 5% to 17%. This trend towards less MPS and more budgetary transfers is the result of various reforms in Common Agricultural Policies (CAP) (MacSharry, Agenda 2000 and Mid-term review), that led to a reduction in intervention prices, compensated by increased direct payments to producers.

Chart D2.3
Composition of Support to Producers in the EU
1986-2010

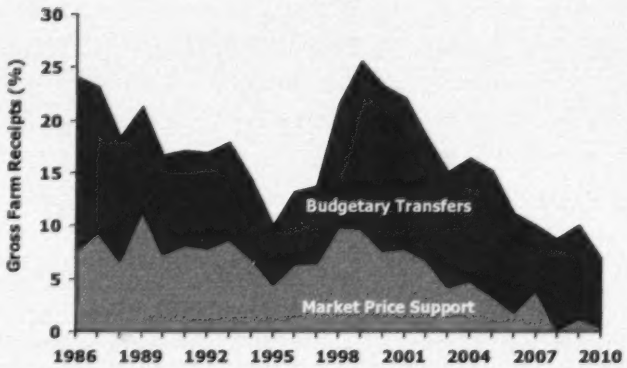


Source: OECD, Trade and Agriculture Directorate, Producer and Consumer Support Estimates, OECD Database.
Note: 2010 data is preliminary.

- **In 2010, only 6% of total support to producers in the U.S. was provided through MPS, representing less than 1% of GFR, while budgetary transfers represented 7%.**

  Since 1986, both MPS and budgetary transfers, expressed as a percent of GFR, have decreased significantly. MPS has decreased from 8% of GFR in 1986 to less than 1% in 2010, while budgetary transfers have increased from 17% to 7% in the U.S. Except for 1989, budgetary transfers have always been higher than MPS. Milk has always been the commodity which receives the highest level of support through MPS in the U.S., with the exception of 2008 and 2010.

Chart D2.4
Composition of Support to Producers in the U.S.
1986-2010



Source: OECD, Trade and Agriculture Directorate, Producer and Consumer Support Estimates, OECD Database.
Note: 2010 data is preliminary.

Acronyms / Initialisms

A

AAFC	Agriculture and Agri-Food Canada
AIMS	Alberta Agriculture Input Monitoring System
APF	Agricultural Policy Framework

B

BMP	Beneficial Management Practice
BSE	Bovine Spongiform Encephalopathy

C

CAP	Common Agricultural Policy
CANSIM	Canadian Socioeconomic Information Management System
CFIA	Canadian Food Inspection Agency
CIBC	Canadian Imperial Bank of Commerce
CN	Canadian National Railway
COOL	Country of Origin Labelling
CP	Canadian Pacific Railway
CPG	Consumer Packaged Goods
CPI	Consumer Price Index
CR4	Concentration Ratio
CRAWUM	Canadian Regional Agricultural Water Use Model

E

EFP	Environmental Farm Plan
EU	European Union

F

FAO	Food and Agriculture Organization of the United Nations
FAOSTAT	Food and Agriculture Organization of the United Nations Statistical Database
FBT	Food, Beverage and Tobacco
FCC	Farm Credit Canada
FDI	Foreign Direct Investment

G

GE	Government Expenditures
GDP	Gross Domestic Product
GFR	Gross Farm Receipts
GHG	Greenhouse Gas
GMO	Genetically Modified Organism

H

HABA	Health and Beauty Aids
HACCP	Hazard Analysis and Critical Control Points

L

LAD	Longitudinal Administrative Database
LCBO	Liquor Control Board of Ontario

M

MAPAQ	Ministère de l'Agriculture, des Pêcheries et de l'Alimentation du Québec
MPS	Market Price Support

N

NAFTA	North American Free Trade Agreement
NAICS	North American Industrial Classification System

O

OECD	Organisation for Economic Co-operation and Development

P

PSE	Producer Support Estimate

R

R&D	Research and Development
ROW	Rest of the World

S

SAQ	Société des alcools du Québec
SPG	Saskatchewan Pulse Growers
STAN	STructural ANalysis

T

TFP	Total Factor Productivity

U

UK	United Kingdom
US	United States
USDA	United States Department of Agriculture
USDA ERS	United States Department of Agriculture Economic Research Service

W

WTO	World Trade Organization

Y

YFE	Young Farmer Enterprises

GLOSSARY

The Canadian Agriculture and Agri-Food System

Agriculture and Agri-Food Sector

The agriculture and agri-food sector is composed of all industries whose primary role is to produce food and agricultural products. It encompasses both primary agriculture and food and beverage processors.

Canadian Agriculture and Agri-Food System

The Canadian agriculture and agri-food system is a value chain of industries focussed on producing agricultural and food products. It includes agricultural input and service suppliers, primary agriculture, food, beverage and tobacco processors, food retailers/wholesalers, and foodservice establishments.

Unless otherwise noted, component stages of the agriculture and agri-food system are defined according to the North American Industrial Classification System (NAICS). A detailed listing of included industries for each component stage of the system is provided below.

Primary Agriculture

Primary agriculture is composed of the following industries as defined by NAICS:

At the 3-digit level

- 111 Crop Production
- 112 Animal Production

At the 4-digit level

- 1111 Oilseed and Grain Farming
- 1112 Vegetable and Melon Farming
- 1113 Fruit and Tree Nut Farming
- 1114 Greenhouse, Nursery and Floriculture Production
- 1119 Other Crop Farming
- 1121 Cattle Ranching and Farming
- 1122 Hog and Pig Farming
- 1123 Poultry and Egg Production
- 1124 Sheep and Goat Farming
- 1125 Animal Aquaculture
- 1129 Other Animal Production

Food and Beverage Processing

Food and beverage processing is composed of the following industries as defined by NAICS:

At the 3-digit level

- 311 Food Manufacturing
- 312 Beverage and Tobacco Product Manufacturing

At the 4-digit level

- 3111 Animal Food Manufacturing
- 3112 Grain and Oilseed Milling
- 3113 Sugar and Confectionery Product Manufacturing
- 3114 Fruit and Vegetable Preserving and Specialty Food Manufacturing

3115 Dairy Product Manufacturing
3116 Meat Product Manufacturing
3117 Seafood Product Preparation and Packaging
3118 Bakery and Tortilla Manufacturing
3119 Other Food Manufacturing
3121 Beverage Manufacturing

Agricultural Input & Service Suppliers
Agricultural input and service suppliers are composed of the following industries as defined by NAICS:

At the 4-digit level
1151 Support Activities for Crop Production
1152 Support Activities for Animal Production
3253 Pesticide, Fertilizer and Other Agricultural Chemical Manufacturing
4171 Farm, Lawn and Garden Machinery and Equipment Wholesaler-Distributors
4183 Agricultural Supplies Wholesaler-Distributors

At the 5-digit level
33311 Agricultural Implement Manufacturing

Food Retailers/Wholesalers
Food retailers/wholesalers are composed of the following industries as defined by NAICS:

At the 3-digit level
411 Farm Product Wholesaler-Distributors
413 Food, Beverage and Tobacco Wholesaler-Distributors
445 Food and Beverage Stores

Foodservice
Foodservice is composed of the following industries as defined by NAICS:

At the 3-digit level
722 Food Services and Drinking Places

At the 4-digit level
4542 Vending Machine Operators

Consumers

Consumers reside outside of the agri-food system because they are not a component industry, but they are however, the main driver of the agri-food value chain. The aim of a value chain is to realign the agri-food system to the end consumer where the emphasis is on value creation and innovation.

Total Current Consumption
Shows the expenses incurred for food, shelter, household operations, household furnishings and equipment, clothing, transportation, health care, personal care, recreation, reading materials, education, tobacco products and alcoholic beverages, games of chance, and a miscellaneous group of items.

Personal Expenditure on Consumer Goods and Services
Household spending on new consumer goods and on consumer services, plus any mark-up on used goods.

Classification of Food Purchases

Food Purchased from Stores
Food purchased from stores includes supermarkets, food specialty stores (butcher shops, fresh produce stores, bakeries, fish markets, delicatessens, health food stores, markets or stands, and direct purchases

from producers and frozen food suppliers, outdoor farmers' markets and stands, and all other non-service establishments), convenience stores, and other (any other type of store that sells food items, such as department stores, club-type stores, drug stores, etc.).

Food Purchased from Restaurants
Food purchased from restaurants includes table-service restaurants, fast-food restaurants, cafeterias and other (refreshment stands, snack bars, vending machines, chip wagons and caterers). They are usually found at supermarkets, theatres, exhibitions, sports events, parks, etc.

Farm Definitions

Agricultural Co-operative (Farm Co-op)
A legal business entity owned and democratically controlled equally by its members, where the members have a close association with the enterprise as producers or consumers of its products or services. Agricultural co-operatives can be divided into two broad categories: agricultural service co-operatives, which provide various services or inputs to their individual farming members, and agricultural production co-operatives, where production resources (land, buildings and machinery) are pooled and members farm jointly.

Census Farm
An agricultural operation that has the intention of producing at least one of the following products: crops (field crops, tree fruits and nuts, berries or grapes, vegetables, seed); livestock (cattle, pigs, sheep, horses, exotic birds, etc.), animal products (milk or cream, eggs, wool, fur, meat), or other agricultural products (greenhouse or nursery products, Christmas trees, mushrooms, sod, honey, maple syrup products).

Communal Farms
This includes both co-operatives and other communal operations such as Hutterite colonies.

Incorporated Farm
A legal business entity separate from the persons who own, manage or operate the business. The business owners or shareholders are not personally liable for any of the debts of the company, other than the value of their investments in the company due to the legal independence of the business.

Non-family Farms
Farms organized as non-family corporations, co-operatives or other communal operations. It also includes farms held in estates or trusts.

Partnership
A type of business entity in which the business partners share with each other the profits or losses of the business, and where there is no legal distinction between the owners and the business. All partners manage the business and are personally liable for its debts except in the case of a limited partnership, where certain partners may relinquish their ability to manage the business in exchange for limited liability in the partnership's debts.

Sole Proprietorship
A type of business entity, which is owned and run by one individual and where there is no legal distinction between the owner and the business. It is a sole proprietorship in the sense that the owner has no partners.

Unincorporated Farms
Farm businesses where there is no legal distinction between the owners and the business, which include sole proprietorships and partnerships.

Young Farmer Enterprises
Young farmer enterprises (YFEs) are defined as those farms in which all operators (whether one or two or more) are between 18 and 39 years of age.

Farm Income Definitions

Average Family Income
Average family income is that income level derived by dividing total family income by the number of families.

Capital Cost Allowance
Capital cost allowance refers to the amount deducted for depreciable property for tax purposes.

Cash Rent
Cash rent usually involves a per-acre agreed arrangement between the landowner and are often set for a multi-year period. The producer is usually required to ensure proper stewardship of the land by ensuring that pests are properly controlled but the same rate is paid regardless of what the output of the land is.

Debt to Asset Ratio
Debt to asset ratio at the farm level is total debt divided by total assets.

Debt to Equity Ratio
Debt to equity ratio at the industry level is total debt divided by total equity.

Direct Payments
Direct payments include the amounts paid under government agricultural programs and agricultural programs funded by the private sector. These are insurance programs funded totally by premiums paid by producers. Only those payments related to current agricultural production and paid directly to individuals involved in agricultural production are included.

Farm Cash Receipts
Includes revenues from the sale of agricultural commodities, program payments from government agencies, and payments from private crop and livestock insurance programs. Receipts are recorded in the calendar year (Jan.-Dec.) when the money is paid (cash basis) to farmers.

Farm Expenses
Farm expenses are estimates of farm operating expenses and represent business costs incurred by farm operators for goods and services used in the production of agricultural commodities. All expense information is on a calendar year basis. If direct rebates are paid to farmers to reduce the cost of particular inputs, then the net expense estimates are used in the preparation of net income, although both gross and net expenses may be displayed. As the objective is to produce provincial estimates of net income, flows from one farm to another are excluded from the estimates. The province can be viewed as one large farm.

Farm Family Income
Farm family income is the sum of the total income of the operator and his/her family members. It includes income from both farm and non-farm sources.

Farm Net Worth
Farm net worth is measured as the total assets of the farm evaluated at current market value less total liabilities.

Market Receipts
Market receipts refers to cash income from the sale of agricultural commodities, but excludes direct program payments to producers.

Median Family Income
Median family income is that level of family income where there are an equal number of families with income below that level as there are above it.

Net Cash Income
Net cash income measures farm business cash flow (farm cash receipts minus operating expenses) generated from the production of agricultural goods. Net cash income represents the amount of money available for debt repayment, investment or withdrawal by the owner.

Net Operating Income
Net operating income is a term used at the farm level, and it is the difference between gross farm revenues and total farm cash expenses.

Net Worth
Net worth is measured as total assets evaluated at current market value less total liabilities.

Non-Farm Employment Income
Employment income which originates from sources other than the farm operation (such as gross wages and salaries) and net self-employment income (from business, professional, commission and fishing) not related to the farm operation.

Non-Farm Self-Employment Income
Net income earned by a farm owner/operator from self-employment in a non-farm business.

Off-Farm Income
Income earned by a farm operator or farm family members from sources other than farm self-employment, this includes wages and salaries, net off-farm self-employment income, investment income, government social transfers and other off-farm income.

Profit Margin Ratio
Profit margin ratio at the industry level is calculated as operating profits divided by total operating revenues. Operating profit is the net result of the principal business activities of a firm. It is calculated before taking into account interest expense, investment income, non-recurring losses from the write-down of assets, gains or losses realized on the disposal of assets, and income tax expense. This ratio indicates management's ability to generate earnings from the principal business activities of a firm.

Rate of Return on Long-Term Capital
The rate of return on long-term capital is calculated as operating income (without deducting either taxes or interest paid) divided by long-term capital, where long-term capital is taken to be the sum of shareholders' equity and long-term debt.

Realized Net Income
Realized net income is the difference between a farmer's cash receipts and operating expenses, minus depreciation plus income in kind. It represents the financial flows, both cash and non-cash, attributable to the farm businesses, similar to an income statement. It represents the net income from transactions in a given year in that it includes the sale of commodities regardless of the year they were produced.

Return on Assets
The rate of return on assets at the farm level is calculated as net operating income plus interest expense minus capital cost allowance divided by the total value of assets at cost. In the case of dairy and poultry farms, the allowance on eligible capital property for quota was also deducted.

Return on Equity
The rate of return on equity at the farm level is calculated as net operating income minus capital cost allowance divided by net worth at cost. In the case of dairy and poultry farms, the allowance on eligible capital property for quota was also deducted.

Return on Equity Ratio
Return on equity ratio at the industry level is calculated as after-tax profit divided by total equity x 100. This ratio measures the level of return to the owners (investors) and it represents their measure of profitability. The earnings figure is the after-tax profit, including a deduction for interest expense (payments to lenders). It is the net profit available to the owners (investors). The ratio indicates how many cents are returned to every dollar invested by the owners.

Share Rent
Share rent, or share-cropping, involves the landowner and renter sharing in the inputs and outputs of the land. A percentage sharing agreement is agreed upon between the two parties. The rent paid depends on production decisions made by the two parties and the output of the crop produced on the land. Therefore, the landowner in a share-crop situation is assuming more downside risk in years where production is down but has the opportunity for a greater rent value in years where production is above average.

Trade Categories

Agriculture and Agri-Food Exports
Agriculture and agri-food exports include the export of agriculture commodities, food (excluding seafood and seafood products), non-alcoholic beverages (including bottled water), alcoholic beverages, tobacco products, and floriculture and nursery.

Primary Exports
Primary exports are products that have received little or no processing and are based on commodity groupings.

Processed Exports
Processed exports are products that have received some processing and are ready for further processing or final consumption.

Agriculture and Agri-Food Imports
Agriculture and agri-food imports include the import of agriculture commodities, food (excluding seafood and seafood products), non-alcoholic beverages (including bottled water), alcoholic beverages, tobacco products and floriculture and nursery.

Intra-Regional Trade
Trade between two regions in a given location. For example trade between Canadian provinces or between the European Union member countries.

Government Support Categories

Government Expenditures
Government spending (at all levels) on agriculture and food processing in a year, both direct and indirect, to individuals, agencies or associations.

Major Categories of Expenditures

Development, Trade and Environment-Related Program Expenditures
Include administration and capital expenditures incurred by the government to work on regional development, marketing and trade, and environmental activities as well as grants and contributions issued by the government for work on these activities.

Operating and Capital Expenditures
Include government expenditures on general administration and management, and on policy information and statistical services.

Other Expenditures
Include government expenditures on food aid and international assistance, extension, and education as well as social program payments and tax expenditures.

Program Payment Expenditures
Include payments for income support and stabilization programs, ad hoc and cost reduction programs, agri-insurance and financing assistance programs.

Research and Inspection Expenditures
Include administration and capital expenditures incurred by the government to perform research and inspection activities, as well as grants and contributions issued by the government for work on these activities.

Storage and Freight Assistance Expenditures
Program payments for storage and freight.

Public Infrastructure
The quantity of physical capital owned by the municipal, provincial and federal governments of Canada. This includes: buildings such as schools, hospitals, libraries and post offices; engineering structures (see below), and machinery such as ambulances, buses, rapid transit cars and snow removal vehicles.

Engineering Infrastructure
This is comprised of engineering structures owned by the municipal, provincial and federal governments of Canada. It includes: highways, roads and streets, bridges, rail track, port facilities, waterworks, sewers and sewage treatment plants.

Government Support Measures

Budgetary Transfers
Budgetary expenditures from governments providing direct payments to agricultural producers.

Market Price Support (MPS)
Transfers to agricultural producers from policy measures that create a gap between domestic market prices and border prices of a specific agricultural commodity.

Producer Support Estimate (PSE)
A yearly measure of policy support to farm producers. It is the sum of market price support and budgetary payments to producers, expressed as a percentage of gross farm receipts.

Gross Farm Receipts (GFR)
The value of commodity production plus the direct transfers received by producers in the current year.

Single Commodity Transfers
Transfers to agricultural producers from policy linked to the production of a single commodity, such that the producer must produce the designated commodity in order to receive the transfer.

Economic and Statistical Terminology

Advanced Technology
Advanced technology refers to a new technology that performs a new function or improves some function significantly better than commonly used technologies. Examples include biotechnology, nanotechnology, etc.

Benefit/Cost Ratio
The benefit/cost ratio is a ratio where the numerator consists of all direct benefits and the denominator consists of all direct costs. In other words, the benefit/cost ratio is expressed in terms of favourable monetary consequences to project beneficiaries, offset by any negative benefits.

Capital Stock
Fixed capital is comprised of buildings, engineering structures and machinery and equipment. Total investment in fixed capital is made up of purchases needed to offset depreciation (replacement needs) and purchases to expand the capital stock. When replacement needs exceed investment, the capital stock falls, since the existing stock is not being maintained. When investment exceeds replacement needs, the stock increases.

Chained Dollars
A measure to express real volumes of production or expenditure by removing the distorting effects of price changes over time.

Check-offs
Producer association check-off schemes are common sources of funding for R&D innovation, promotion and development of agriculture commodities. These schemes usually involve an annual assessment of marketings or sales, where the revenue is pooled by the grower organization and a percentage share or fixed amount levy is collected for these purposes.

Concentration Ratio (CR4)
Concentration ratio is a measure of an industry's concentration level and expresses sales of a set number of the top firms in the industry as a percentage of total industry sales. CR4 is the acronym for the concentration ratio of the top four firms in the industry.

Constant Prices
Constant prices refers to a value from which the overall effect of a general price inflation has been removed.

Crop Yield
Crop yield is a measure of the amount of a crop harvested per unit of land area.

Foreign Direct Investment (FDI)
FDI refers to investment by non-residents in an enterprise where the non-residents own 10 percent or more of the ordinary shares or voting power in incorporated enterprises or the equivalent in unincorporated enterprises.

Gross Domestic Product (GDP)
The GDP for a country is the total unduplicated value of the goods and services produced in that country during a given period.

Internal Rate of Return (IRR)
The IRR, in percentage, is based on the producer benefit/cost ratio. The benefits and the costs are discounted so that the present worth of all costs equals the present worth of all benefits. Various interest rates can be assumed.

Labour Productivity
Labour productivity is a measure of an industry's output per hour of labour worked.

Marketing
Marketing in the agricultural sector includes all of the services involved in moving an agricultural product from the farm to the consumer. Numerous interconnected activities are involved, such as growing, harvesting, grading, packing, transporting, storing, and food processing, distribution, advertising and sales.

Net Value-Added
Net value-added measures agriculture's contribution to the national economy's production of goods and services created in a particular year. It is derived by calculating the total value of agricultural sector production, including program payments, and subtracting the related costs of production (expenses on inputs, business taxes and depreciation). Net value-added is distributed to the various factors of production, including rent to non-operator landlords, interest to lenders, wages and profits.

Quintiles
Quintiles are ranking households in ascending order of total household income and organized into five groups of equal numbers.

Quota Value
The value of a specified quantity of a supply-managed agricultural commodity, such as those in the dairy or poultry industries, which a producer has an obligation to supply.

Rural Area
All territory outside urban areas is considered rural. Taken together, urban and rural areas cover all of Canada.

Total Factor Productivity (TFP)
TFP measures the efficiency in use of all inputs and is measured as output divided by all inputs (i.e., capital, labour, etc.). TFP growth is then measured as the rate of growth of this ratio.

Value-Added Production
Value-added production refers to products that have undergone some processing.

Urban Area
Urban area includes all large metropolitan areas (even though they do contain some rural areas), most small metropolitan areas (also called census agglomerations). In some cases, where a census agglomeration contains a large rural population, only the urban portion is considered urban. As well, urban areas based on the census definition: "urban areas have minimum population concentrations of 1,000 and a population density of at least 400 per square kilometre, based on the previous census population counts." Taken together, urban and rural areas cover all of Canada.

Environmental Terminology

Arable Land
The FAO defines arable land as land under temporary crops, meadow or pasture.

Beneficial Management Practices (BMPs)
Beneficial management practices are methods or techniques found to be the most effective and practical means in achieving an objective (such as preventing or minimizing pollution) while making the optimum use of the firm's resources.

Biomass (input)
Biomass refers to renewable biological materials, and includes: biological materials from forestry, agriculture, marine and aquaculture sources, or of a micro-biological origin; by-products from processing (e.g., agricultural/forestry/pulp and paper/food/feed processing); recycled bio-materials (e.g., construction/demolition materials); and waste materials (e.g., municipal solid wastes).

Bioproducts (output)
Bioproducts are products (other than food, feed, and medicines) made from renewable biological inputs (often referred to as using a biomass feedstock). For the purpose of the 2009 Bioproducts Production and Development Survey, firms were asked to provide information regarding "non-conventional industrial bioproducts" or traditional bioproducts, such as wood products, if they were made by a non-conventional or novel process.

Environmental Farm Plan (EFP)
A formal, written farm environmental farm plan is an overall assessment of environmental issues or concerns related to a farming operation, and can include individual and/or group planning processes as part of a federal, provincial or industry program.

Greenhouse Gases (GHG)
Greenhouse gases refers to carbon dioxide, nitrous oxide, methane, ozone and chloro-fluorocarbons occurring naturally and resulting from human (production and consumption) activities, and contributing to the greenhouse effect (global warming).

Soil Conservation Practices

Buffer Zones around Water Bodies
Areas along natural watercourses left with natural vegetation (unfarmed) and designed to prevent erosion, especially in stream channels that become wider and shallower; preserve wildlife habitat and fish stocks; protect water quality for livestock and people. Also referred to as riparian areas, i.e., land bordering a stream or body of water.

Conservation Tillage
Conservation tillage is a tillage system that creates a suitable soil environment for growing a crop and that conserves soil, water and energy resources mainly through the reduction in the intensity of tillage, and retention of plant residues.

Conventional Tillage
Conventional tillage is a tillage system using cultivation as the major means of seedbed preparation and weed control.

Crop Rotation
Changing the type of crop grown on the same land from year to year or periodically to control weeds, insects, disease, and replenish soil nutrients or reduce erosion.

Land Use, Land Use Changes and Forestry (LULUCF)
Defined by the United Nations Climate Change Secretariat as "a greenhouse gas inventory sector that covers emissions and removals of greenhouse gases resulting from direct human-induced land use, land-use change and forestry activities."

No-tillage Farming
No-tillage (also known as no-till or zero tillage) is a practice in which the crop is sown directly into soil and not tilled from the harvest of the previous crop. Weed control is achieved by the use of herbicides, and stubble is retained for erosion control. It is typically practised in arable areas where fallowing is important.

Riparian Buffer Strip
Riparian buffer strip is a narrow strip of land along a watercourse designed to reduce erosion, intercept pollutants, provide habitat for wildlife and address other environmental concerns.

Rotational Grazing
A practice allowing forages to recover after each grazing period. Includes alternating two or more pastures at regular intervals or using temporary fences within pastures to prevent overgrazing.

Summerfallow
Summerfallow involves keeping normally cultivated land free of vegetation throughout one growing season by cultivating and/or applying chemicals to destroy weeds, insects and soil-borne diseases and allow a buildup of soil moisture reserves for the next crop year.

Windbreaks or Shelterbelts
Windbreaks or shelterbelts are rows of natural or planted trees or hedges along field edges that stop prevailing winds from eroding the soil. Used more frequently in western Canada, where farmland is more susceptible to wind action and where trapping snow for moisture is important.

Winter Cover Crops
A crop, such as red clover, fall rye, etc., seeded in the fall to protect the soil from water and wind erosion during the winter and from heavy rains and run-off in the spring.

Units of Measure

CO_2 eq	Carbon dioxide equivalent
CO_2 eq (kg/kg of lw)	Carbon dioxide equivalent divided by kilograms of live animal weight
cwt	Hundredweight tonnes
cwt lw	Hundredweight tonnes live weight
GHGEI/ECI (kg CO_2eq/MJ)	Greenhouse Gas Emission Intensity/Energy Consumption Intensity (kilograms of carbon dioxide equivalent divided by megajoule)
kt	Kilo tonnes
kt dw	Kilo tonnes dressed weight
kt lw	Kilo tonnes live weight
Mt	Mega tonnes
mt	Metric tonnes

Data Sources and References

Section A – Special Feature

Section A1: Employment Trends in Canada's Agriculture and Agri-Food System

Chart	Source
A1.1-A1.3	Statistics Canada, Annual Labour Force Survey, special tabulation
A1.4	Statistics Canada, CANSIM Table 282-0008 – Labour force survey estimates (LFS), by North American Industry Classification System (NAICS), sex and age group, annual
A1.5	Statistics Canada, Annual Labour Force Survey
A1.6	Statistics Canada, Annual Labour Force Survey, special tabulation
A1.7	OECD, Annual Labour Force Statistics database, summary tables
A1.8	OECD, Annual Labour Force Statistics database, Main Economic Indicators database
A1.9	Statistics Canada, CANSIM Table 282-0012 – Labour force survey estimates (LFS), employment by class of worker, North American Industry Classification System (NAICS) and sex, annual
A1.10	Statistics Canada, CANSIM Table 282-0031 – Labour force survey estimates (LFS), multiple jobholders by North American Industry Classification System (NAICS), sex and age group, annual
A1.11	Statistics Canada, CANSIM 383-0022 – Multifactor productivity, gross output, value-added, capital, labour and intermediate inputs at a detailed industry level, by North American Industry Classification System (NAICS), annual (index, 2002=100 unless otherwise noted)
A1.12	Statistics Canada, Census of Population 2006, Catalogue No. 97-564-XCB2006006
A1.13	Statistics Canada, Annual Survey of Manufactures and Logging (ASML)
A1.14	Statistics Canada, Survey of Employment, Payroll and Hours (SEPH)
A1.15	Statistics Canada, Annual Survey of Manufactures and Logging (ASML), special tabulation
A1.16	Statistics Canada, Census of Population, 2006
A1.17	Statistics Canada, Survey of Innovation and Business Strategy, 2009

Section B – The Agriculture and Agri-Food System and the Canadian Economy

Section B1: GDP and Employment

Chart	Source
B1.1 -B1.2	Statistics Canada, CANSIM Table 379-0027 – Gross Domestic Product (GDP) at basic prices by North American Industry Classification System (NAICS); CANSIM Table 301-0003 – Annual survey of manufactures (ASM), principal statistics by North American Industry Classification System (NAICS), incorporated businesses with employees having sales of manufactured goods greater than or equal to $30,000, annual (dollars unless otherwise noted) *T*; CANSIM Table 301-0006 – Principal statistics for manufacturing industries, by North American Industry Classification System (NAICS), annual
B1.3-B1.4	Statistics Canada, Annual Labour Force Survey, special tabulation

B1.5-B1.6	Statistics Canada, CANSIM Table 379-0027 – Gross Domestic Product (GDP) at basic prices, by North American Industry Classification System (NAICS); CANSIM Table 379-0025 – Gross Domestic Product (GDP) at basic prices, by North American Industry Classification System (NAICS) and province, annual Provincial GDP and special tabulations
B1.7-B1.8	Statistics Canada, Annual Labour Force Survey, special tabulation

Section B2: International Trade

CHART	SOURCE
B2.1-B2.2	Global Trade Atlas
B2.3-B2.26	Statistics Canada, Canadian International Merchandise Trade Data via AAFC's Trade Data Retrieval System

Section B3: Productivity and Innovation in the Agriculture, Agri-Food and Agri-Based Products Industries

CHART	SOURCE
B3.1	AAFC, Canadian Primary Agriculture Productivity Database, 1961-2006
B3.2	AAFC, Canadian Primary Agriculture Productivity Database, 1961-2006 United States Department of Agriculture, Economic Research Service http://www.ers.usda.gov/data/agproductivity/alltables.xls
B3.3	Statistics Canada, CANSIM Table 383-0022 – Multifactor productivity, gross output, value-added, capital, labour and intermediate inputs at a detailed industry level, by North American Industry Classification System (NAICS) annual (index, 2002=100 unless otherwise noted)
B3.4	Statistics Canada, CANSIM Table 383-0022 – Multifactor productivity, gross output, value-added, capital, labour and intermediate inputs at a detailed industry level, by North American Industry Classification System (NAICS) annual (index, 2002=100 unless otherwise noted) United States Department of Labor, Bureau of Labor Statistics, 1987-2006 Aggregate Manufacturing and Manufacturing Industries (KLEMS) Multifactor Productivity Tables
B3.5	AAFC, Farm Income, Financial Conditions and Government Assistance – Databook, Table C.3 (May 2011 update)
B3.6	OECD, Trade and Agriculture Directorate, Producer and Consumer Support Estimates, OECD database, 1986-2010
B3.7	Statistics Canada, CANSIM Table 358-0024 – Business enterprise research and development (BERD) characteristics, by industry group based on the North American Industry Classification System (NAICS), annual (dollars unless otherwise noted)
B3.8	Gray, R., C. Nagy, V. Galushko and S. Weseen, Returns to Pulse Crop Research & Development and the Management of Intellectual Property Rights, December 2008
B3.9	Statistics Canada, Catalogue No. 22-002-X Field Crop Reporting Series, Stocks of Principal Field Crops at July 31, 2010
B3.10	Canfax and AAFC, various years
B3.11	Statistics Canada, Census of Agriculture, various years
B3.12	Statistics Canada, Farm Financial Survey, 2008
B3.13	Statistics Canada, National Renewal Survey, 2007
B3.14	AAFC, Strategic Issues Tracking Survey, conducted by Ipsos Reid, 2009
B3.15	Statistics Canada, Catalogue No. 88-001-X Science Statistics – vol.33 No.4 – Industrial Research and Development, 2005-2009, September 2008 Edition, 1980 to 1994, special tabulation
B3.16	OECD, Structural Analysis (STAN) Indicators database, 2009
B3.17-B3.22	Statistics Canada, Survey of Innovation and Business Strategy, 2009
B3.23-B3.30	Statistics Canada, Bioproducts Production and Development Survey, 2009

Section C – Components of the Agriculture and Agri-Food System

Section C1: Consumers

Chart	Source
C1.1-C1.2	Statistics Canada, CANSIM Table 380-0024 – Personal expenditure on goods and services, annual 2009, for food purchased from stores and special tabulation for food purchased from restaurants
C1.3	CANISM Table 051-0001 – Estimates of population, by age group and sex for July 1, Canada, provinces and territories, annual (persons unless otherwise noted), CANSIM Table 380-0019 Sector accounts, persons and unincorporated businesses, annual (dollars unless otherwise noted), and CANSIM Table 380-0056 – Gross domestic product (GDP) indexes, annual (2002=100)
C1.4	CIBC World Markets Household Credit Analysis, July 2011
C1.5	Statistics Canada, CANSIM Table 380-0024 – Personal expenditure on goods and services, annual 2009, for food purchased from stores and special tabulation for food purchased from restaurants
C1.6	Statistics Canada, CANSIM Table 380-0024 – Personal expenditure on goods and services, annual 2009 and CANSIM Table 051-0001 – Estimates of population, by age group and sex for July 1, Canada, provinces and territories, annual (persons)
C1.7	Statistics Canada, Survey of Household Spending 2009, special tabulation
C1.8	Statistics Canada, Catalogue No. 62-202-X Spending Patterns In Canada, 2009
	U.S. Bureau of Labor Statistics, Consumer Expenditures in 2009, Report No. 1029, Annual Consumer Expenditure Survey
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C1.9	OECD, OLIS database
C1.10-C1.11	Statistics Canada, CANSIM Table 326-0021 – Consumer price index (CPI), 2005 basket, annual (2002=100)
C1.12-C1.13	Statistics Canada, CANSIM Table 002-0019 – Food available by major groups in Canada, annual (kilograms per person, per year unless otherwise noted)
C1.14	Statistics Canada, CANSIM Table 002-0010 – Supply and disposition of food in Canada, annual (tonnes unless otherwise noted)
C1.15-C1.16	Farm Credit Canada, Vision Research: Canadian Consumer Food Purchase Intentions, 2010
C1.17-C1.18	OECD Report, Greening Household Behaviour: The Role of Public Policy, 2011
C1.19-C1.20	University of Alberta Calculation, Using Leger marketing (2009) and TNS Global Market Research (2009, 2010) data

Section C2: Food Distribution (Retail/Wholesale and Foodservice)

Chart	Source
C2.1	Canadian Grocer, Jan/Feb 2001, National Market Survey, Canadian Food Store Sales, 2000, pg. 22-31, Julia Drake
	Canadian Grocer, Feb 2010 (sales figures for 2009 are estimated based on preliminary Statistics Canada data for supermarkets and Canadian Grocers 2010 Survey of Chains and Groups)
C2.2	Canadian Grocer Magazine, February 2010
C2.3	TNS (UK), AC Nielsen (Canada), L'expansion.com (France), U.S. Census Bureau (U.S.) from CIBC World Markets Retail Conference Presentation, March 2009
C2.4	Statistics Canada, CANSIM Table 187-0002 – Quarterly statement of changes in financial position, by North American Industry Classification System (NAICS), selected financial ratios and selected seasonally adjusted components, quarterly (dollars unless otherwise noted) special tabulation
C2.5	Statistics Canada, CANSIM Table 080-0019 – Retail commodity sales, by retail trade sector based on the North American Industry Classification System (NAICS), quarterly (dollars) and Table 080-0022 Retail commodity survey based on the North American Industry Classification System (NAICS), quarterly (dollars)
C2.6	Nielsen MarketTrack, National All Channels, 52 weeks to July 3, 2010

C2.7	Statistics Canada, CANSIM Table 355-0006 – Monthly survey of food services and drinking places, by North American Industry Classification System (NAICS), monthly
C2.8	Canadian Restaurant and Foodservices Association (CRFA), Quarterly InfoStats 2003, special tabulation for 2004-2009
C2.9	CRFA, Foodservice Facts 2010; from CREST/NPD Group and ReCount
C2.10	Statistics Canada, CANSIM Table 355-0006 – Monthly survey of food services and drinking places, by North American Industry Classification System (NAICS), monthly
	Canadian Restaurant and Foodservices Association, Foodservice Facts, 2011
C2.11	Statistics Canada, CANSIM Table 180-0003 – Financial and taxation statistics for enterprises, by North American Industry Classification System (NAICS), annual
C2.12	fsSTRATEGY Inc, 2011 Canadian Institutional Foodservice Market Report

Section C3: Food and Beverage Processing

CHART	SOURCE
C3.1	Statistics Canada Input/Output Model
C3.2	Statistics Canada, CANSIM Table 379-0017 – Gross Domestic Product (GDP) at basic prices by North American Industry Classification System (NAICS), annual
C3.3	Statistics Canada, CANSIM Table 281-0024 – Employment (SEPH), unadjusted for seasonal variation, by type of employee for selected industries classified using the North American Industry Classification System (NAICS), annual (persons)
C3.4	Statistics Canada, Annual Survey of Manufactures and Logging, 2009
C3.5	Statistics Canada, Monthly Survey of Manufacturing, 2010
C3.6-C3.8	Statistics Canada, Annual Survey of Manufactures and Logging, special tabulation
C3.9	Statistics Canada, Annual Survey of Manufactures *T* 1990 to 2002 and Annual Survey of Manufactures and Logging 2003 to 2009
C3.10	Statistics Canada, CANSIM Table 304-0014 – Manufacturers' sales, inventories, orders and inventory to sales ratios, by North American Industry Classification System (NAICS) and CANSIM Table 329-0038 – Industry price indexes, by North American Industry Classification System (NAICS)
C3.11-C3.18	Statistics Canada, Canadian International Merchandise Trade Data via AAFC's Trade Data Retrieval System
	Statistics Canada, Monthly Survey of Manufacturing, 2010
C3.19	Statistics Canada, CANSIM Table 301-0006 – Principal statistics for manufacturing industries by North American Industry Classification System (NAICS), annual
C3.20	Statistics Canada, CANSIM Table 281-0027 – Average weekly earnings (SEPH), unadjusted for seasonal variation, by type of employee for selected industries classified using the North American Industry Classification System (NAICS), annual (current dollars)
C3.21-C3.22	Statistics Canada, CANSIM Table 330-0006 – Raw materials price indexes, monthly (index, 1997=100) *T*
C3.23-C3.24	Statistics Canada, CANSIM Table 031-0002 – Flows and stocks of fixed non-residential capital, by North American Industry Classification System (NAICS) and asset, Canada, provinces and territories, annual (dollars)
C3.25-C3.26	Statistics Canada, CANSIM Table 187-0002 – Quarterly financial statistics for enterprises, special tabulation
C3.27-C3.29	Statistics Canada, CANSIM Table 376-0052 – International investment position, Canadian direct investment abroad and foreign direct investment in Canada, by North American Industry Classification System (NAICS) and region, annual (dollars)

Section C4: Primary Agriculture

CHART	SOURCE
C4.1	Statistics Canada Input/Output Model

C4.2	Statistics Canada, Census of Agriculture, various years
C4.3	Statistics Canada, 2006 Census of Agriculture
C4.4-C4.6	Statistics Canada, CANSIM Table 002-0001 – Farm cash receipts, annual (dollars)
C4.7-C4.8	OECD, World Trade Atlas and AAFC calculations
C4.9	Canadian Wheat Board and University of Guelph, Ridgetown College
C4.10	Canfax annual report
	United States Department of Agriculture, Economic Research Service, Livestock, Dairy and Poultry Outlook
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C4.11-C4.12	Statistics Canada, CANSIM Table 002-0001 – Farm cash receipts, annual (dollars)
C4.13	Statistics Canada, CANSIM Table 002-0009 – Net farm income, annual (dollars) and Statistics Canada, CANSIM Table 002-0001 – Farm cash receipts, annual (dollars)
C4.14	Statistics Canada, CANSIM Table 002-0009 – Net farm income, annual (dollars)
C4.15	Statistics Canada, CANSIM Table 002-0004 – Agriculture value added account, annual (dollars)
C4.16	Statistics Canada, Catalogue No. 21-017-XIE – Agriculture Economic Statistics, May 2011
C4.17-C4.18	Statistics Canada, Taxation Data Program
C4.19	Statistics Canada, Farm Financial Survey, 1999 and 2009
C4.20	Statistics Canada, Farm Financial Survey, 2009
C4.21	Statistics Canada, Farm Financial Survey, 1997 to 2009
C4.22	Statistics Canada, Farm Financial Survey, 2009
C4.23-C4.25	Statistics Canada, Taxation Data Program
C4.26	Statistics Canada, Farm Financial Survey, 2009
C4.27	Statistics Canada, Farm Financial Survey, 2004 to 2009
C4.28	Statistics Canada, Taxation Data Program
C4.29-C4.30	Statistics Canada, Whole Farm Database, Taxation Data Program
C4.31	Statistics Canada, Farm Financial Survey, 1995 to 2009
C4.32	Statistics Canada, Farm Financial Survey, 2007 to 2009
C4.33	Statistics Canada, Farm Financial Survey, 2009
C4.34	Statistics Canada, Farm Financial Survey, 1997 to 2009
C4.35	Statistics Canada, Farm Financial Survey, 1995 to 2009
C4.36	Statistics Canada, Farm Financial Survey, 2009
C4.37-C4.38	Statistics Canada, Corporate Taxfiler Database, various years

Section C5: Inputs to Primary Agriculture

CHART	SOURCE
C5.1	AAFC
C5.2-C5.3	Statistics Canada, CANSIM Table 002-0005 – Farm operating expenses and depreciation charges, annual (dollars)
C5.4	Statistics Canada, CANSIM Table 328-0015 – Farm input price index, quarterly (index, 2002=100)
C5.5	University of Guleph, Ridgetown College and Chicago Board of Trade
C5.6	Statistics Canada, Catalogue No. 23-012-XWE – Cattle Statistics
	Canfax – Alberta feeder steers 5-600lbs
C5.7	AAFC, Farm Input Price Survey and Alberta Agriculture and Food, Economics and Competitiveness Division, Statistics and Data Development Unit's Alberta Agricultural Input Monitoring System (AIMS)
C5.8	Alberta Agriculture and Food, Economics and Competitiveness Division, Statistics and Data Development Unit's Alberta Agricultural Input Monitoring System (AIMS) and the United States Energy Information Administration

C5.9-C5.10	Statistics Canada, CANSIM Table 002-0005 – Farm operating expenses and depreciation charges, annual (dollars x 1,000)
C5.11	Statistics Canada, CANSIM Table 002-0005 – Farm operating expenses and depreciation charges, annual (dollars) and AAFC's Farm Input Price Survey
C5.12	Statistics Canada, CANSIM Table 329-0064 – Industry price indexes for machinery and equipment, motor vehicles and other transport equipment, monthly (index, 2002=100)
C5.13	AAFC, Farm Input Price Survey
	Quorum Corporation, Rail and Trucking Freight Rate Index (2002=100): 2010-2011 Annual Report Data Tables, Trucking Rates: Table 4A-1, Composite Freight Rates and Railway Freight Rates: Table 4C-1, Composite Freight Rates
C5.14	Statistics Canada, monthly Labour Force Survey, 2010
C5.15	Statistics Canada, Input-Output Tables, special tabulation
C5.16	Statistics Canada, CANSIM Table 002-0005 – Farm operating expenses and depreciation charges, annual (dollars)

Section C6: Natural Resource Use and Environmental Impacts

Chart	Source
C6.1-C6.2	AAFC, Strategic Issues Tracking Survey, conducted by Ipsos Reid, 2009
C6.3-C6.4	AAFC, Renewal Survey, 2004 and 2007
C6.5-C6.6	Statistics Canada, Census of Agriculture 2006 and AAFC, Farm Environmental Management Survey, 2006
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Section D – Government and the Agriculture and Agri-Food Sector

Section D1: Government Expenditures

Chart	Source
D1.1-D1.9	AAFC, Government Expenditures Database (May 2011 update)
D1.10	AAFC, Corporate Income Tax Rate Database: Canada and the Provinces, 1960-2005 via AAFC Online

D1.11	Statistics Canada, CANSIM Table 031-0002 – Flows and Stocks of Fixed Non-Residential Capital, by North American Industry Classification System (NAICS) and asset, Canada, provinces and territories, annual (dollars)

Section D2: Producer Support Estimate and Agricultural Policies in Other Countries

Chart	Source
D2.1-D2.4	OECD, Trade and Agriculture Directorate, Producer and Consumer Support Estimates, OECD database, 1986-2010